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Municipal Land Use Regulation in the Fowl Meadow and Ponkapoag Bog Area of Critical Environmental Concern:

Assessment and Recommendations

May 1997

Prepared for the Three Rivers Interlocal Council
a Subregion of the Metropolitan Area Planning Council

Errata

Please note the following corrections to Map 1: 1985/1991 MacConnell Land Use:

1. The legend is missing a residential category. The dark brown color on the map is a high-density residential land use category and should be included in the legend with the following description: "Residential, multi-family or less than ¼ acre lots."

2. The legend category that reads: "Residential, up to ½ acre lots" should be revised to read: "Residential, ¼ to ½ acre lots".

About this Report

The Metropolitan Area Planning Council (MAPC) is Greater Boston's officially designated regional planning agency. Its membership consists of a community representative from each of the 80 towns and 21 cities in the region, 21 gubernatorial appointees, and 14 ex-officio members representing 11 state agencies and three Boston agencies. The Council helps its member communities plan in the areas of economic development, land use, housing, demographics, transportation, and environmental quality.

The Three Rivers Interlocal Council (TRIC) is one of eight subregions of the MAPC. Its membership consists of Selectmen and Planning Board members from 12 communities: Canton, Dedham, Dover, Foxborough, Medfield, Milton, Needham, Norwood, Sharon, Stoughton, Walpole, and Westwood. Eleven of the 12 communities (all but Needham) have at least some land area within the Neponset River basin, and several of the communities are located entirely within the Neponset River basin.

Due to its concern about existing and potential development threats to the Fowl Meadow and Ponkapoag Bog Area of Critical Environmental Concern (ACEC), the TRIC subregion requested that MAPC assess current and potential future land use in the ACEC and make recommendations to foster protection of ACEC resources.

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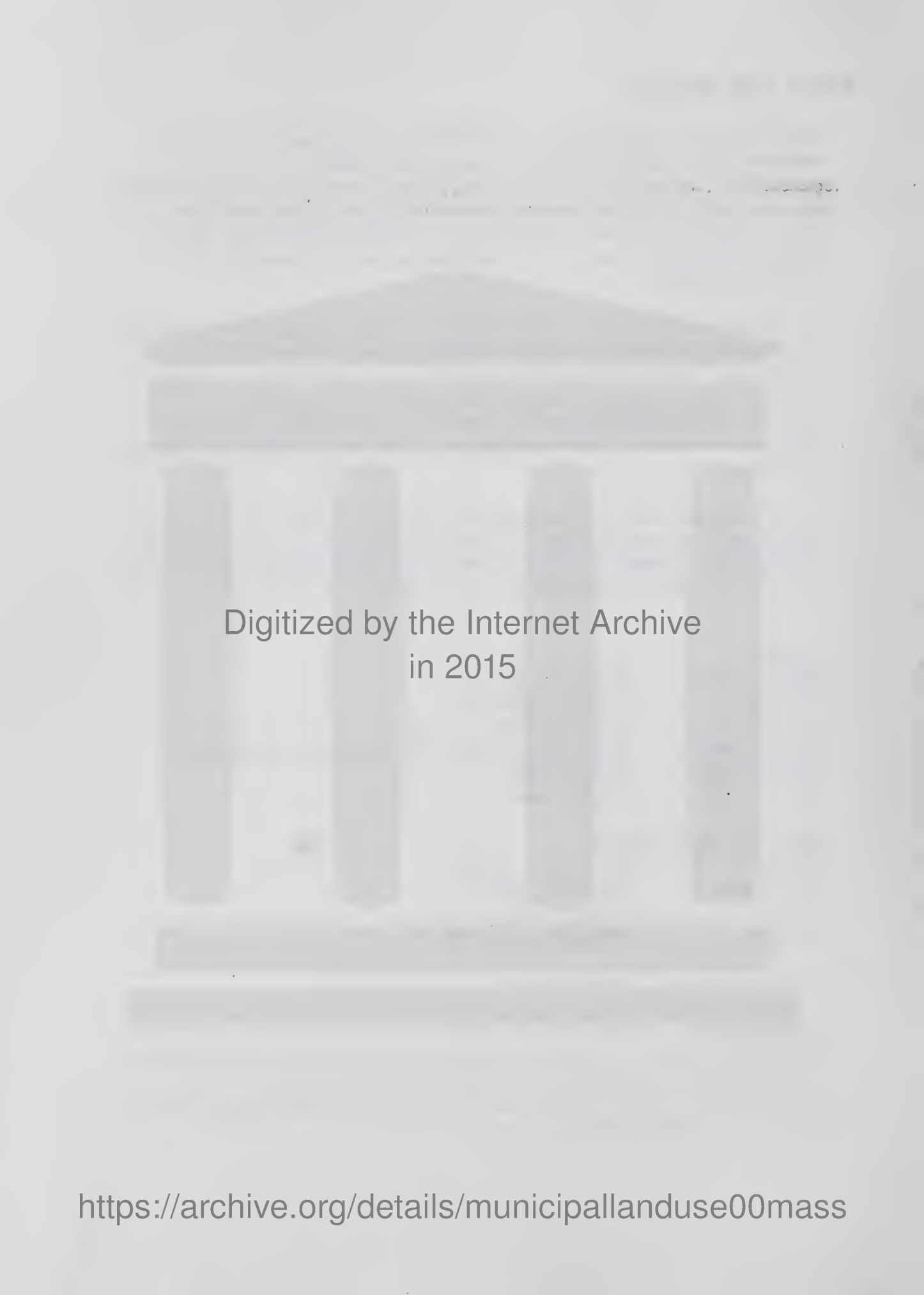
To the many community officials and watershed activists who provided critical data and information for this plan and to Liz Sorenson, Leslie Luchonok and Cathy Garnett of the Department of Environmental Management's ACEC Program for their thorough review and thoughtful comments.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Executive Summary

Purpose and Goals of the Project

This project was conducted by the Metropolitan Area Planning Council as a special project for the Three Rivers Interlocal Council, one of eight "subregions" within the MAPC. The purpose of this project is to foster protection of the Fowl Meadow and Ponkapoag Bog Area of Critical Environmental Concern (ACEC) through improved land use and land use regulation within the ACEC. The critical resources of the Fowl Meadow and Ponkapoag Bog ACEC include wetlands and floodplains that protect lives and property from flooding, a highly productive aquifer that supplies several communities with drinking water, habitat for rare species and sites of archaeological and historic significance. This project identifies major issues regarding existing and potential development within the ACEC, assesses municipal land use regulations and recommends measures the towns can use to further protect the ACEC from the impacts of development.

Six of the 12 TRIC communities have land area within the Fowl Meadow and Ponkapoag Bog ACEC. These six communities — Canton, Dedham, Milton, Norwood, Sharon and Westwood — are the subject of this report. The ACEC also includes land area in Boston and Randolph, but because these communities are not members of TRIC, they are not included in this report. Note that throughout this report, mention of the "ACEC communities" generally refers only to the six communities in TRIC that have land area in the ACEC.

Approximately 31 percent, or about 2,600 acres, of the ACEC is owned by the Commonwealth and managed by the Metropolitan District Commission (MDC) as part of the MDC Blue Hills Reservation. MDC lands include 1,253 acres of the Fowl Meadow portion of the ACEC and 1,369 acres of the Ponkapoag Bog ACEC. Except for a brief description of MDC facilities and the MDC Resource Management Plan in Section 1.5 ("Major Regional Projects"), this report does not address issues relative to MDC lands.

The MDC has engaged consultants to conduct a Resource Management Plan for MDC lands within the ACEC. The focus of the MDC Resource Management Plan is on natural resources, cultural resources and human activities on MDC lands that are

in the ACEC. The focus of this MAPC project is on existing and potential development within the ACEC. Together, the MDC and MAPC documents are complementary in that they look at different areas that together form the bulk of the ACEC. Some land (particularly land owned for preservation purposes by organizations other than the MDC and non-MDC owned land in Boston or Randolph) will not be addressed in either the MAPC or the MDC document.

Major Findings and Recommendations

The major findings and recommendations of this report are summarized below.

Findings

- All of the land within the ACEC is zoned for industrial, residential or commercial development despite the fact that the land may be in public ownership for preservation purposes or may be unbuildable wetland or floodplain. Thirty-six percent of the ACEC is zoned for industrial uses and 29 percent is zoned for residential development with lots less than an acre in size.

- Most of the undeveloped land within the ACEC is owned for preservation purposes, is undevelopable wetland or floodplain, or both. There are, however, several areas that are about to be developed or are likely to see development proposals in the future. Development pressures in the area encompassing the ACEC are intense because of its location at the nexus of two major highways (Route 128 and I-95) and its access to local (MBTA) and regional (Amtrak- Northeast Corridor) railroad service.

- Two areas identified as being of significant concern with regard to potential future development are Indian Lookout (also called Signal Hill) in Canton, which includes critical archaeological resources, and an area in Norwood that abuts Purgatory Brook and University Avenue and has documented identification of rare and endangered habitats. Both areas are zoned for industrial uses.

- There are several major regional projects, primarily transportation-related, that are either underway or being considered within the ACEC. These projects,

discussed in Section 1.5 of the report, could have a significant impact on the ACEC.

- Concerns related to existing and past development within the ACEC include:

    - stormwater runoff from Route 128, I-95, and Route 1 and the large amount of development along Route 1 in Norwood (particularly the "Auto Mile");
    - Pollution from existing industrial uses (Cumberland Farms in Canton and Stop & Shop in Dedham and Boston were the two sites most frequently noted); and
    - Pollution from past industrial uses, including several hazardous waste sites.

- There are 7,511 acres of ACEC lands in the six study communities. The most recent MacConnell land use data (1985 and 1991) show that 61 percent of the ACEC in the six communities is undeveloped and 39 percent is developed. The primary developed land use is residential (17 percent), followed by recreation (9 percent), transportation (8 percent), industrial (5 percent), and commercial (1 percent).

- Low-flow issues in the Neponset were only peripherally addressed in this report. Several communities withdraw drinking water from the basin but "export" their wastewater out of the basin via the MWRA sewer system. This loss of water contributes to low-flow issues that can impact aquatic species, wetlands functioning, wetlands habitat, aquifer recharge, aesthetics and recreational values.

- The formal state regulatory requirements regarding ACECs affect a very small percentage of the overall land regulation, management and development activities that take place within an ACEC. Municipal efforts are essential to the long-term protection and management of ACECs.

- The six communities have adopted zoning overlay districts to protect drinking water resources, however zoning overlay districts do not always protect aquifer areas that recharge wells in neighboring communities. For example, a

large portion of the Zone II (recharge area) for the Dedham-Westwood Water District's new Fowl Meadow well lies within Canton, in an area that does not have any zoning overlay protection.

- The Neponset River Watershed Association and local "Stream Teams" are collecting important information about threats to tributary streams and the mainstem of the Neponset River. These Stream Teams are the "eyes and ears" of the watershed and can provide valuable information to community officials.

- The Neponset River Watershed Association and the Executive Office of Environmental Affairs published the Neponset River Watershed Basin Wide Action Plan in March 1997. The plan is a useful document that establishes goals and actions to improve the health of the watershed.

Recommendations

- **Adoption and enforcement of good local wetlands bylaws and regulations is perhaps the most important measure communities can take to protect the ACEC.** The state-mandated 100-foot wetlands buffer zone should be protected from development to the greatest extent possible. In particular, communities should adopt an undisturbed buffer zone adjacent to wetlands within the ACEC. Canton, Dedham, Sharon and Milton have all done so, and Westwood regulates the first 10 feet adjacent to wetlands as part of the resource area. MAPC recommends that Norwood adopt an undisturbed buffer zone provision to prohibit building at the edge of the wetlands.

- Zoning is a community's blueprint for development and should reflect the community's vision for an area. The communities should look more closely at lands located within the ACEC and determine whether rezoning is appropriate, particularly for lands zoned for industrial development. Rezoning of parcels within the ACEC should be done with consideration of the unique environmental resources of a given area, the community's Master Plan, Open Space Plan, abutting land uses and abutting zoning.

- The six communities should consider adopting an ACEC bylaw or regulation that pertains to projects constructed within the ACEC, or within a certain

distance of the ACEC. The regulations can establish specific standards, setbacks and guidance for projects that have an impact on the ACEC. ACEC-specific bylaws/regulations are discussed in section 8.2.1

- Acquisition or conservation restrictions should be considered as a means to protect important parcels in the ACEC.

- Communities should work together to amend zoning overlay districts as needed to protect aquifer areas that recharge wells in neighboring communities.

- Most of the communities could do more to prevent stormwater pollution from new developments and ensure that water quality improvements are included when a site is redeveloped.

- Conservation Commissions should become familiar with the new Stormwater Management Policy and Stormwater Management Standards issued by DEP and discuss how and when they can begin to adopt them.

- Most of the communities could do more to ensure that site plans are developed with environmental resource protection in mind. Site planning should integrate comprehensive stormwater management from the outset. Zoning should allow cluster development and flexible site plans. Revisions to building height limits could be revised where appropriate (i.e., where aesthetics and vista views would not be impaired) to encourage developments to build up, not out.

- Subdivision regulations should aim for flexibility while ensuring safety. Some existing subdivision regulations can exacerbate stormwater runoff problems (e.g., by requiring excessively large street widths and curb and gutter streets).

- Local highway departments should integrate stormwater improvements into the design of roadway maintenance projects. New roadways should be designed with environmental protection, as well as safety, in mind. Towns

should consider upgrading storm drain systems in sensitive areas and where stormwater pollution problems have been identified.

- The Massachusetts Highway Department should upgrade drainage systems on Route 1, 128 and I-95 to improve water quality in the ACEC. Stormwater improvements should be an integral part of the Mass. Highway Department's Route 128 widening project. Improvements to stormwater drainage on Route 1 and I-95 should at least be conducted in tandem with highway improvements, as required by the Stormwater Management Policy. The median on I-95 has sufficient land area for stormwater treatment systems.

- Street sweeping and catch basin cleaning should be conducted to remove the accumulated sediment from the winter months before spring precipitation. Catch basin cleaning schedules should be prioritized so that catch basins in critical water resource areas are cleaned more frequently.

- Future needs include technical assistance to town boards, intercommunity cooperation to protect aquifer recharge areas that cross town boundaries, stewardship of the ACEC, public education and outreach, remediation of pollution problems and restoration of damaged and destroyed wetlands.

- Communities, watershed activists and businesses interested in improving the health of the ACEC and the watershed can use the Neponset River Watershed Basin Wide Action Plan, published in March 1997, to set priorities and actions. They can also become involved in the Riverway's Adopt-a-Stream program and the Neponset River Watershed Association's Stream Teams.

Report Organization

This report is organized as follows:

Chapter 1 contains an overview of the ACEC program and function, a summary of the critical resources within the Fowl Meadow and Ponkapoag Bog ACEC, and a regional overview of the ACEC, including land use, zoning and a summary of major regional projects. GIS maps of land use (1985/1991) and zoning are included in chapter 1.

Chapters 2 through 7 are organized by community in alphabetical order (Canton through Westwood). Readers that are interested in one community need only focus on the appropriate community chapter along with chapters 1, 8 and 9.

Chapters 2 through 7 begin with a box highlighting the major findings and recommendations for the community, and are followed by an inventory of existing land uses in the ACEC, a discussion of potential future land uses that could adversely affect ACEC resources, and a review of local bylaws, regulations and practices that affect land use development and water quality. The issues discussed in these chapters were identified through interviews with local officials, state agencies and non-profit organizations active in the watershed.

Chapter 8 contains general recommendations for all of the communities.

Chapter 9 summarizes additional needs for protection of ACEC resources.

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1.0 Regional Level Overview of the Fowl Meadow and Ponkapoag Bog ACEC

1.1 Background and Overview of the ACEC process

The ACEC Program was established in 1975, when the State Legislature authorized and directed the Secretary of Environmental Affairs to identify and designate "areas of critical environmental concern to the Commonwealth," and to develop policies for their acquisition, protection and use. Since that time 25 ACECs covering 170,000 acres have been designated, from the Berkshires to Cape Cod to the North Shore. The Environmental Affairs Secretary has delegated the administration of the ACEC Program to the Department of Environmental Management (DEM).

The ACEC Regulations (301 CMR 12.00) describe the procedure for the nomination and review of ACECs, and the purpose and general effects of designation. Generally ACECs are nominated by citizens or municipal boards, and nominations undergo a rigorous public review prior to formal designation. The Fowl Meadow and Ponkapoag Bog ACEC was nominated jointly by the Neponset River Watershed Association and the Conservation Commissions of the eight municipalities located within the ACEC in 1991, and was formally designated by the Environmental Secretary in August, 1992.

An ACEC is an area containing concentrations of highly significant environmental resources, ranging from wetlands and water supply areas to rare species habitats and agricultural areas. To be eligible for designation, an area must contain at least four resource categories or features listed in the ACEC regulations, (the Fowl Meadow Ponkapoag Bog ACEC includes seven), and the resources and area must be of at least regional or statewide significance. The ecological interrelationships of the resources are just as important as the individual categories.

The ACEC designation is a formal state designation directed principally to the actions and jurisdictions of state environmental agencies. The ACEC regulations generally direct Executive Office of Environmental Affairs (EOEA) agencies to take actions, administer programs, and revise regulations in order to preserve, restore or enhance the resources of ACECs. Consequently, an ACEC designation does not create new regulations to implement the goals of designation, but works through the existing

state environmental framework. The principal role of DEM ACEC program staff is to work with other state agencies to help preserve and manage ACECs, to provide overall coordination between federal, state and local agencies and private organizations and citizens, and to encourage public education and environmental planning at the local level.

The specific state regulatory requirements concerning ACECs are outlined in the June, 1993 ACEC Program Guide. For inland ACECs such as the Fowl Meadow/Ponkapoag Bog ACEC, the principal state agencies or regulations associated with ACECs are the Massachusetts Environmental Policy Act (MEPA) Unit and the Department of Environmental Protection (DEP).

The MEPA Regulations (301 CMR 11.00) require closer scrutiny or review of projects that require certain state permits, state funding, or state agency actions. The review threshold, or size of projects that require the filing of an Environmental Notification Form (ENF), is reduced for projects located within an ACEC. For example, a state highway access permit requires the filing of an ENF. Also, within an ACEC, a request for an appeal (i.e., a DEP superseding order of conditions) of a local Conservation Commission decision (i.e., a local order of conditions) will trigger a state environmental review through the filing of an ENF. Outside of an ACEC, these kinds of reviews are generally required only for larger-sized projects. Projects using state funding, or projects initiated by state agencies such as the Massachusetts Highway Department (such as for highway improvement projects that may affect the resources of an ACEC) or the Metropolitan District Commission (for park planning or development) within an ACEC also require MEPA reviews. The purpose of the reviews are to ensure that the proposed project will minimize or avoid adverse impacts to the resources of the ACEC.

Principal DEP regulations regarding ACECs include a prohibition of the siting of new solid waste facilities within an ACEC (310 CMR 16.00) and the prohibition of the destruction or impairment of a "Bordering Vegetated Wetland (BVW)" unless the proposed project qualifies as an "limited project" under the Wetlands Protection Act Regulations (310 CMR 10.00, 10.53(3), 10.55(4)(5)).

For more detailed information, citizens and communities are encouraged to contact ACEC Program staff or other state agencies directly. ACEC Program staff often

coordinate with municipal boards, commissions or departments or environmental organizations like the Neponset River Watershed Association regarding reviews of the kinds of projects mentioned above, particularly MEPA reviews.

The formal state regulatory requirements regarding ACECs affect a very small percentage of the overall land regulation, management and development activities that take place within an ACEC. Therefore, wider goals of an ACEC designation include educating communities and residents about the significance of the resources of the ACEC, encouraging better local and regional coordination and planning, and supporting further municipal efforts to preserve the resources of an ACEC. According to the Environmental Affairs Secretary and ACEC Program staff, this coordination and municipal efforts are essential to the long-term protection and management of ACECs.

1.2 The Fowl Meadow/Ponkapoag Bog ACEC

The Fowl Meadow and Ponkapoag Bog ACEC is approximately 8,350 acres in size. Ninety percent of the ACEC is located within the six Three Rivers communities.

Table 1-1
ACEC Land Area by Community

Community	Acres	Percent of ACEC
Boston*	183	2%
Canton	3573	43%
Dedham	666	8%
Milton	414	5%
Norwood	2187	26%
Randolph*	636	7%
Sharon	503	6%
Westwood	169	2%
Total	**8,331**	**99%****

Notes:
**Boston and Randolph are not members of the Three Rivers Interlocal Council and are therefore not included in this report.*
***Total does not sum to 100% due to rounding.*

About 70 percent of the ACEC is located in just two communities: Canton (43 percent) and Norwood (26 percent). Table 1-1 shows the community breakdown of the ACEC by acreage and percent of ACEC land area.

The ACEC is located in the middle section of the Neponset River watershed. It is important to remember that activities outside, but upstream, of the ACEC can and do have an impact on ACEC resources. The Neponset River watershed encompasses 117 square miles (74,880 acres) and consists of portions of 12 communities plus the entire land area of Canton and Norwood. The quality of water resources in the ACEC are in part determined by the quality of water flowing into the ACEC.

The Fowl Meadow and Ponkapoag Bog ACEC (hereinafter referred to as "the ACEC") was designated an ACEC by the Secretary of Environmental Affairs on August 20, 1992.

The designation papers for the ACEC summarize the resources within the ACEC as follows:

> The central resource features of the Fowl Meadow and Ponkapoag Bog ACEC are the Neponset River and the Ponkapoag Pond and Bog. The Neponset River and its tributaries, the adjacent wetlands and floodplains, the associated aquifers and public water supplies, and the diverse habitats form the core resources of the Fowl Meadow area. Ponkapoag Pond and Bog flow into the Neponset River to the west. The pond, bog, and the natural community and habitats form the core resources of the Ponkapoag Bog area. Historical and archaeological resources, and the recreational and educational values within these areas contribute to the overall significance of the ACEC to the people and communities of the region.

The designation papers also note that the Fowl Meadow is the largest contiguous wetland area in the Neponset River basin and is one of the most significant wetland areas in the metropolitan Boston region. Wetlands are an important feature that provide natural valley storage. They reduce the potential of flood damage by retaining flood waters and releasing them over an extended period of time, lowering peak runoff levels. Wetlands are also important for fish and wildlife habitat, water quality enhancement and preservation, aquifer protection, recreational use, open space, buffer zones and maintenance of streamflow during periods of low flow.

Preservation of the Fowl Meadow wetlands and floodplains is extremely important for flood control. According to GIS data, based on Federal Emergency Management

Agency (FEMA) flood boundary maps, floodplains comprise about 4,350 acres, or 52 percent of the ACEC. Most of this acreage is located in or adjacent to the Fowl Meadow. Extensive flooding of the Fowl Meadow has occurred several times since the early 1800s, most notably in 1936, 1955 (when residents in Hyde Park and Readville had to be evacuated), 1968, 1982 , 1987 and 1994.

Review of the set of USGS topographic maps dating back to 1941 shows the extensive amount of development that has occurred in the Fowl Meadow wetlands and floodplains since that time. Encroachment into the floodplain reduces flood storage capacity and increases the frequency and severity of flood events. Preservation of the natural wetland system is the most efficient and effective means of flood control.

The aquifer underlying the Fowl Meadow is a substantial resource of regional significance. An analysis conducted by Jason Cortell Associates for the Boston Transportation Planning Review estimates the storage capacity of the aquifer at 13 billion gallons.[1] Three of the six ACEC communities (Canton, Dedham and Westwood) obtain water from within the ACEC, a fourth (Sharon) is exploring a potential source within the ACEC, and a fifth (Norwood) has a wellfield in the ACEC that has not been utilized since the 1950s. As will be mentioned later in this report, a substantial amount of the water withdrawn from the Fowl Meadow aquifer is not returned to the basin via wastewater flow, but is transferred out of the basin to Boston Harbor via the MWRA sewer system. Low flows have a direct impact on the wetland ecosystem and aquatic life. If flows are too low, fish cannot spawn.

With regard to habitat resources, the ACEC designation papers state that:

> The habitat resources of both the Fowl Meadow and Ponkapoag Bog areas include a diverse wildlife population, important natural communities and state-listed rare species. These resources are all the more significant and remarkable due to the proximity and density of the urban development that surrounds the ACEC.

The northern part of Fowl Meadow provides habitat for at least five state-listed rare species. According to the EOEA designation papers, the Natural Heritage Program

[1] As cited in "The Month in Review," published by the Boston Transportation Planning Review, December 1971.

and the MDC cite observations of rare species in the southern part of Fowl Meadow as well. The Ponkapoag Bog, the largest bog of its kind in eastern Massachusetts, is home to eight state-listed rare species, as well as four other animal and three plant species which are on an unofficial "watch list" (EOEA, 1992). The Northern portion of Fowl Meadow (Burma Road), the Ponkapoag Bog and the Boardwalk have been designated by the National Park Service as National Environmental Study Areas, due to their unique habitats, species diversity and opportunities for environmental education.

The ACEC includes many important archaeological and historical resources as well. The EOEA designation, citing the comments of the Massachusetts Historical Commission, states that the "documented continuum of human habitation along the Neponset River, the Fowl Meadow and the Blue Hills extends for approximately 10,000 years to the 'Paleo-Indian Period." Sixteen properties in the ACEC are listed on the National Register and the State Register of Historic Places. In addition, two archeological sites, the East Branch Workshop Site and the Green Hill Site, have been determined to be eligible for listing in the National Register of Historic Places. The Massachusetts Historical Commission also commented that there are numerous historic structures dating from the early 1700s to the early 1900s and an important Native American and colonial period trail within the ACEC. In 1980 the Blue Hills was designated an archaeological protected area by the National Park Service.

1.3 The Watershed Initiative in the Neponset Basin: Resource Assessment and Basin Wide Action Plan

In April 1994, the Massachusetts Executive Office of Affairs (EOEA) began the development of a state-wide watershed initiative, aimed at implementation of integrated watershed planning and management for all of the state's 27 river basins. The plan for the initiative is to provide comprehensive assessment of each watershed, followed by integrated review and decisions for state permits and development of watershed management plans. EOEA has formed multi-agency teams to perform integrated assessment and management planning for all the state's river basins. EOEA is encouraging ongoing stewardship of the watersheds through Watershed Community Councils and has developed a $25 million grant program over five years to spur this stewardship effort.

The Neponset River basin served as a pilot watershed for the Watershed Initiative. The DEP conducted a comprehensive assessment of the basin, culminating in the Neponset River Watershed 1994 Resource Assessment Report. The assessment effort included water and sediment quality sampling, biological monitoring, stream discharge monitoring, a review of water withdrawal information and Water Management Act permits, and site visits of wastewater discharge permit holders.

The Watershed Initiative has been taken a step further in the Neponset River basin with the publication in March 1997 of the Neponset River Watershed Basin Wide Action Plan. This plan, prepared by the Neponset River Watershed Association and the Executive Office of Environmental Affairs, summarizes conditions and establishes specific goals and action recommendations for each subwatershed in the Neponset River basin.

Figure 1 is taken from the 1994 Resource Assessment Report and shows the subwatershed boundaries in the Neponset River Basin. The ACEC encompasses part of the basins labeled 2.1, 2.2 and 2.3. All of the other subwatersheds shown on Figure 1, except for the subwatersheds labeled 2.31 and 3.1, are upstream of the ACEC and can have an impact on water quality in the ACEC.

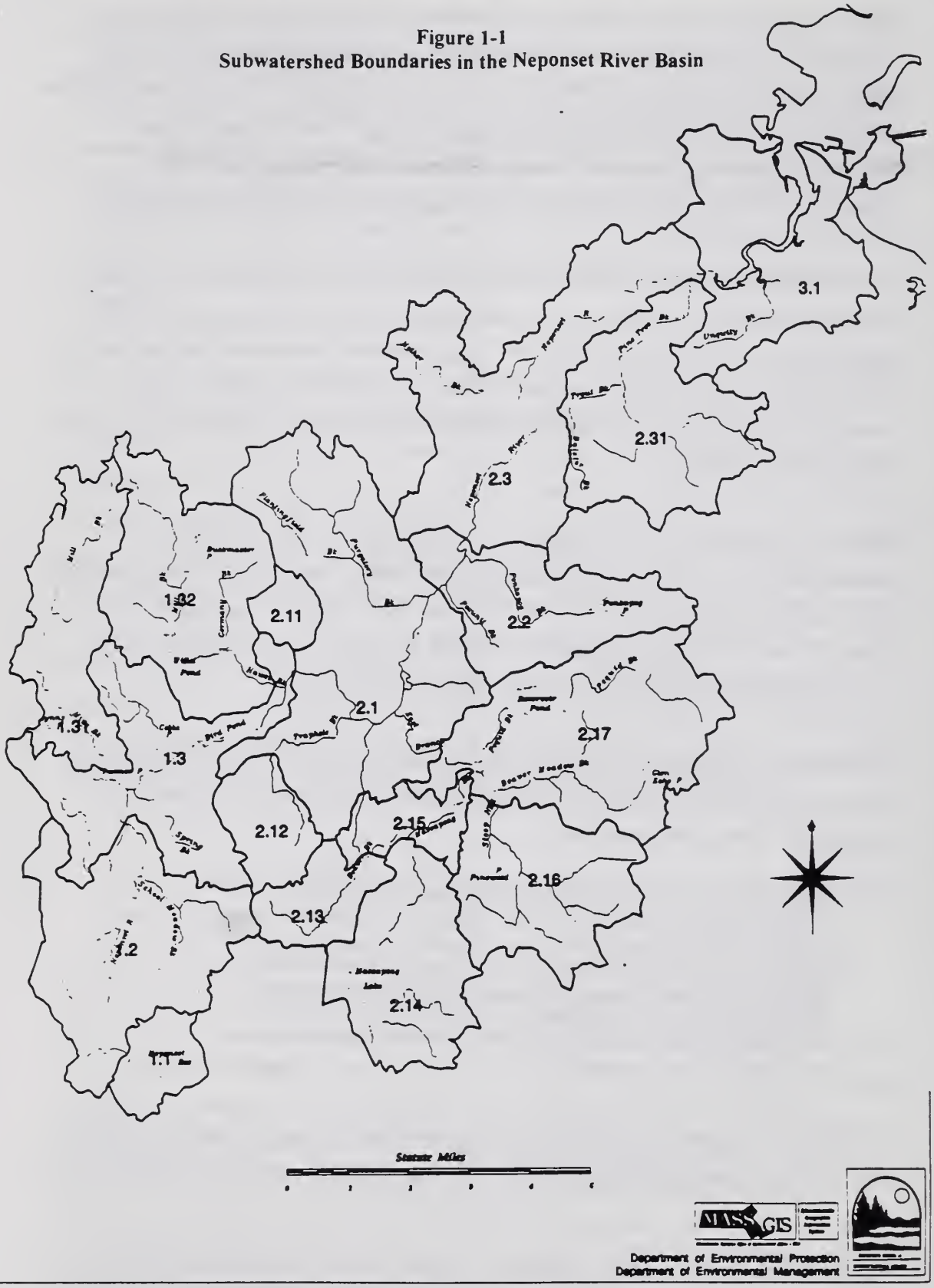
The Resource Assessment concluded that the Neponset River Watershed generally does not support its designated uses (fishing, swimming, support of aquatic life, aesthetics). The report states that:

> Major causes of non-support include elevated bacteria counts, low dissolved oxygen content, high instream temperature, displeasing aesthetic and habitat quality, insufficient streamflow, nonpoint source pollution due to stormwater runoff, illegal connections to storm drains, severe sediment contamination, imbalanced biological communities, elevated concentrations of contaminants in edible fillets of fish, severe eutrophication and/or infestations of non-native or nuisance vegetation in the ponds, lakes and impoundments.[2]

The Resource Assessment divides the watershed into four major segments. Most of the ACEC is located within the middle mainstem segment , but some of the ACEC is

[2] Massachusetts Executive Office of Environmental Affairs, Department of Environmental Protection. The Neponset River Watershed 1994 Resource Assessment Report. Executive Summary. October 1995.

Figure 1-1
Subwatershed Boundaries in the Neponset River Basin



[Reprinted from: Massachusetts Department of Environmental Protection, The Neponset River Watershed 1994 Resource Assessment Report, October 1995.]

also located in the upper mainstem segment (e.g., Hawes Brook) and the East Branch segment. All three of these segments were given an overall rating of "NS" for not supporting their designated uses. With regard to the middle mainstem segment, which includes the Fowl Meadow, the DEP Resource Assessment concluded that:

> Water column conditions were generally found to be non-supportive of the uses designated for this segment, although individual constituents varied with respect to their meeting water quality standards. Like the sediment quality exhibited in the upper Neponset River, severe degradation from elevated concentrations of heavy metals, and sediment toxicity resulted in the overall use support determination of "non-support."
>
> While the Fowl Meadow wetland buffers much of the river from the impacts of development in this segment, the majority of this segment is unaffected by development, potential sources of pollution include stormwater runoff from the major roads and highways which pass over the river in the Fowl Meadow, activities associated with the installation of new public water supply wells, and the New Neponset Valley Relief Sewer Project construction activities, which are scheduled for completion in January, 1996. Other projects being considered in this segment include the Route 128 AMTRAK/Commuter Rail Parking Lot, the Route 128 Transportation Improvement Project, the Northeast Corridor Electrification Improvement Project, and the potential realignment of the Route 128/Route 95 Interchange by the MA Highways Department.

These major projects are discussed in Section 1.5 of this report. Readers are referred to the DEP Resource Assessment for more specific information on water quality, sediment quality and biological assessment at monitoring locations within the ACEC.

1.4 Summary of Land Use and Zoning in the ACEC

The statewide source for land use data in Massachusetts is what is commonly referred to as the "MacConnell Land Use Data," compiled at the University of Massachusetts. These data are available from the MassGIS system. The data and maps are based on the interpretation of aerial photographs. The maps have a minimum parcel size of three acres and a resolution of one acre. The MacConnell Land Use Data is a useful tool for analyzing current land uses and historic changes in land use. Although the data are not field checked and errors in land use interpretation are not uncommon, they remain an excellent information source for regional-scale assessments.

Readers should note that the Friends of the Blue Hills have developed orienteering maps from aerial photographs which have been field checked. The maps cover the Blue Hills, Ponkapoag Bog and the Fowl Meadow from Route 128 to Paul's Bridge.

Map 1: 1985/1991 MacConnell Land Use, shows the most recent available MacConnell land use data for all eight ACEC communities (Boston and Randolph included). Table 1-2 provides a tabular summary of the land use data for the six study communities only.

Readers should note that the mapped and statistical data include data from two series of aerial photographs: 1985 and 1991. A statewide aerial fly-over was conducted in 1991, but the data for all of the communities have not yet been interpreted and digitized. Map 1 and Table 1-2 show the most recently available data, whether 1985 or 1991. 1991 data were available for Canton and Sharon, but only 1985 data were available for Dedham, Milton, Norwood and Westwood.

As shown on Table 1-2, the six communities have 7,511 acres in the ACEC. Based on the most recent available land use data, 61 percent of this acreage is undeveloped and 39 percent is developed. Undeveloped land uses are primarily forest (30 percent) and wetlands (25 percent). Developed land uses are primarily residential (16 percent), recreation (9 percent), and transportation (8 percent). Industrial and commercial uses comprise 5 percent and 1 percent of the ACEC, respectively.

MAPC digitized zoning within the ACEC to develop an understanding of the development potential within the ACEC. The communities' zoning categories were compiled into five categories as follows:

Low-density Residential (LDR)	minimum lot area = 40,000 sq. ft.
Medium-density Residential (MDR)	minimum lot area = 20,000 sq. ft. < 40,000 sq. ft.
High-density Residential (HDR)	minimum lot area < 20,000 sq. ft.
Industrial	(category based on use only, not lot size)
Commercial	(category based on use only, not lot size)

Table 1-2
MacConnell Land Use in the ACEC for the Six Study Communities
1985 and 1991*

Land Use	Area (Acres)	Percent
Undeveloped Land Uses		
Agriculture	150.1	2.0%
Forest	2286.6	30.4%
Wetland	1870.2	24.9%
Open Land/Urban Land	164.3	2.2%
Water	125.2	1.7%
Total Undeveloped Land Uses	4596.2	61.2%
Developed Land Uses		
Residential: multi-family to 1/2 acre lots	766.3	10.2%
Residential: larger than 1/2 acre lots	405.8	5.4%
Commercial	89.8	1.2%
Industrial	357.9	4.8%
Transportation	608.7	8.1%
Recreation	679.6	9.0%
Mining & Waste Disposal	6.4	0.1%
Total Developed Land Uses	2914.6	38.8%
Total land use	7510.8	100.0%

Source: MacConnell land use data is developed by Resource Mapping, Department of Forestry, University of Massachusetts, Amherst and was provided by MassGIS.

***Note:** Dedham, Milton, Norwood and Westwood are based on 1985 land use data. Canton and Sharon are based on 1991 MacConnell land use data.

The zoning data for the ACEC are shown graphically in Map 2: Underlying Zoning and in numerical form in Table 1-3. (Boston and Randolph are included in Map 2 but not in Table 1-3).

All of the land within the ACEC is zoned for development – residential, commercial or industrial – regardless of the ownership or intended use of the property. A comparison of the land use map with the zoning map shows that large tracts of wetlands in Norwood, Canton and Dedham are zoned for industrial development.

It is striking to note that 35 percent of the ACEC is zoned for industrial uses and 29 percent is zoned for residential development with lots less than an acre in size. In many cases land that is owned for preservation purposes (e.g., by the MDC), or land that is privately owned but unbuildable wetland or floodplain may be zoned for industrial development, even though the community does not anticipate its development.

Table 1-3
Underlying Zoning in the ACEC for the Six Study Communities

Zoning Type	Acres	Percent of Study Area
Low Density Residential	2,629	35%
Medium Density Residential	592	8%
High Density Residential	1,543	21%
Commercial	76	1%
Industrial	2,672	36%
TOTAL	7,512	101%*

* Note: The sum is greater than 100% due to rounding.

With so much of this land unintended for development, it is advisable for the communities to consider rezoning much of the land within the ACEC. Zoning is a community's blueprint for development and should reflect the desired land uses.

Rezoning of parcels within the ACEC should be done with consideration of the unique environmental resources of a given area, the community's Master Plan, abutting land uses and abutting zoning. Recommendations on rezoning are discussed in more detail in Section 8.2.3 of this report.

Fowl Meadow and Ponkapoag Bog ACEC

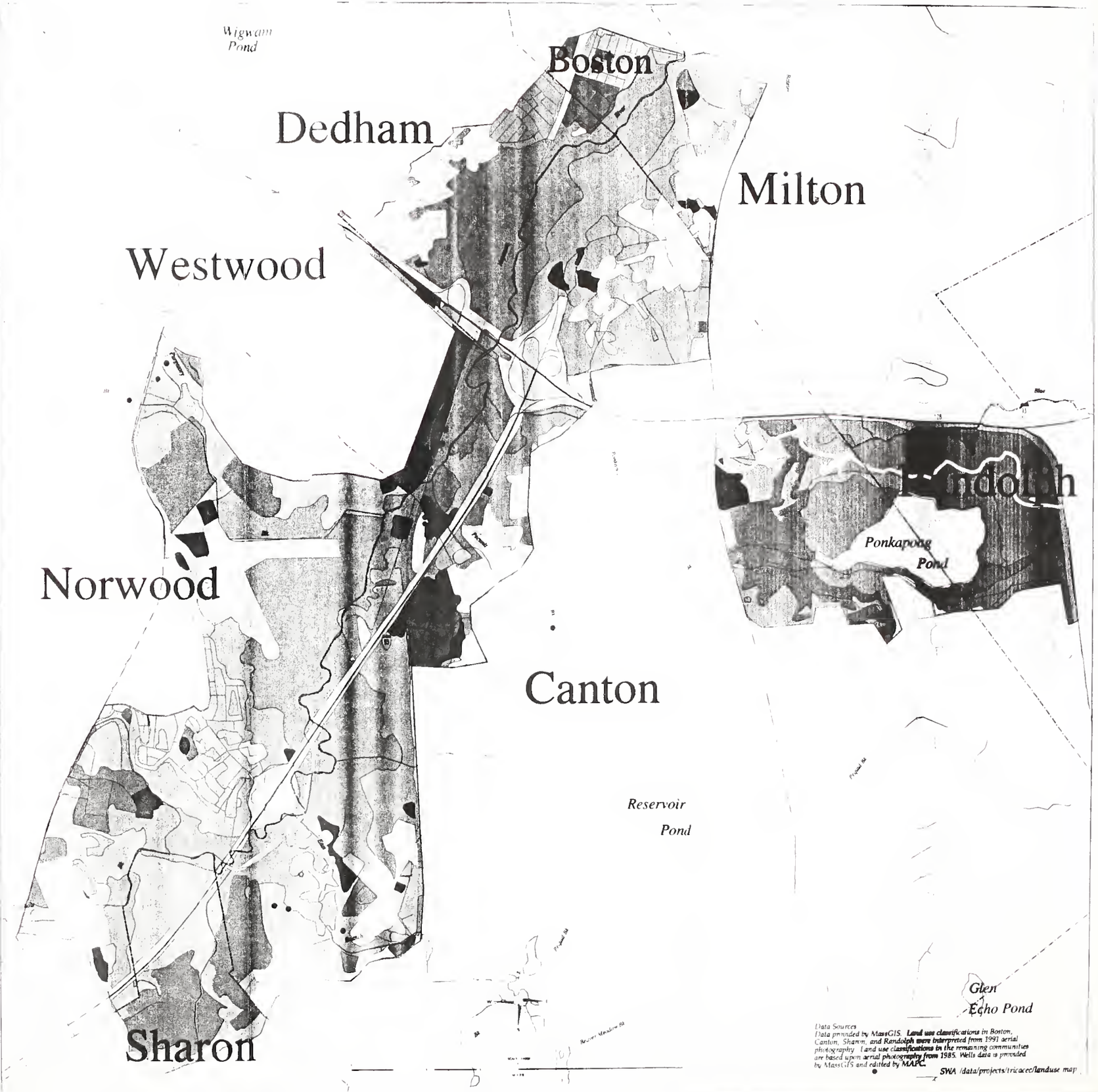
Map 1: 1985/1991 MacConnell Land Use

LAND USE CATEGORIES:

- Residential, larger than 1/2 acre lots
- Residential, up to 1/2 acre lots
- Recreation Areas (includes spectator, participation, and water-based recreation)
- Transportation
- Commercial
- Industrial
- Waste Disposal And Mining
- Undeveloped/Urban Open Land (includes parks, cemeteries, power line ROWs, vacant land, public and institutional greenspace, and abandoned agricultural land)
- Agriculture (includes cropland, pastures, cranberry bogs, and orchards)
- Forest
- Wetlands

OTHER:

- Existing Well
- Proposed Well
- Community Boundary
- Major Basin Divide
- ACEC Boundary
- Stream River
- Interstate or US Route
- State Route
- Rail Lines



The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition or regulatory interpretation.

Produced by the Metropolitan Area Planning Council GIS lab
60 Temple Place, Boston, MA 02111 (617)451-2770

Data Sources
Data provided by MassGIS. Land use classifications in Boston, Canton, Sharon, and Randolph were interpreted from 1991 aerial photography. Land use classifications in the remaining communities are based upon aerial photography from 1985. Wells data is provided by MassGIS and edited by MAPC.

SWA /data/projects/tricacec/landuse.mxd

Fowl Meadow and Ponkapoag Bog ACEC

Map 2: Underlying Zoning

UNDERLYING ZONING:

Low Density Residential
(min. lot size > = 40,000 sq. ft.)

Medium Density Residential
(min. lot size > = 20,000 sq. ft.
but < 40,000 sq. ft.)

High Density Residential
(min. lot size < 20,000 sq. ft.
per dwelling unit)

Commercial

Industrial

OTHER:

- Existing Well

Proposed Well

Community Boundary

Major Basin Divide

ACEC Boundary

Stream/River

Interstate or US Route

State Route

Lake, Pond, or Reservoir

Rail Lines

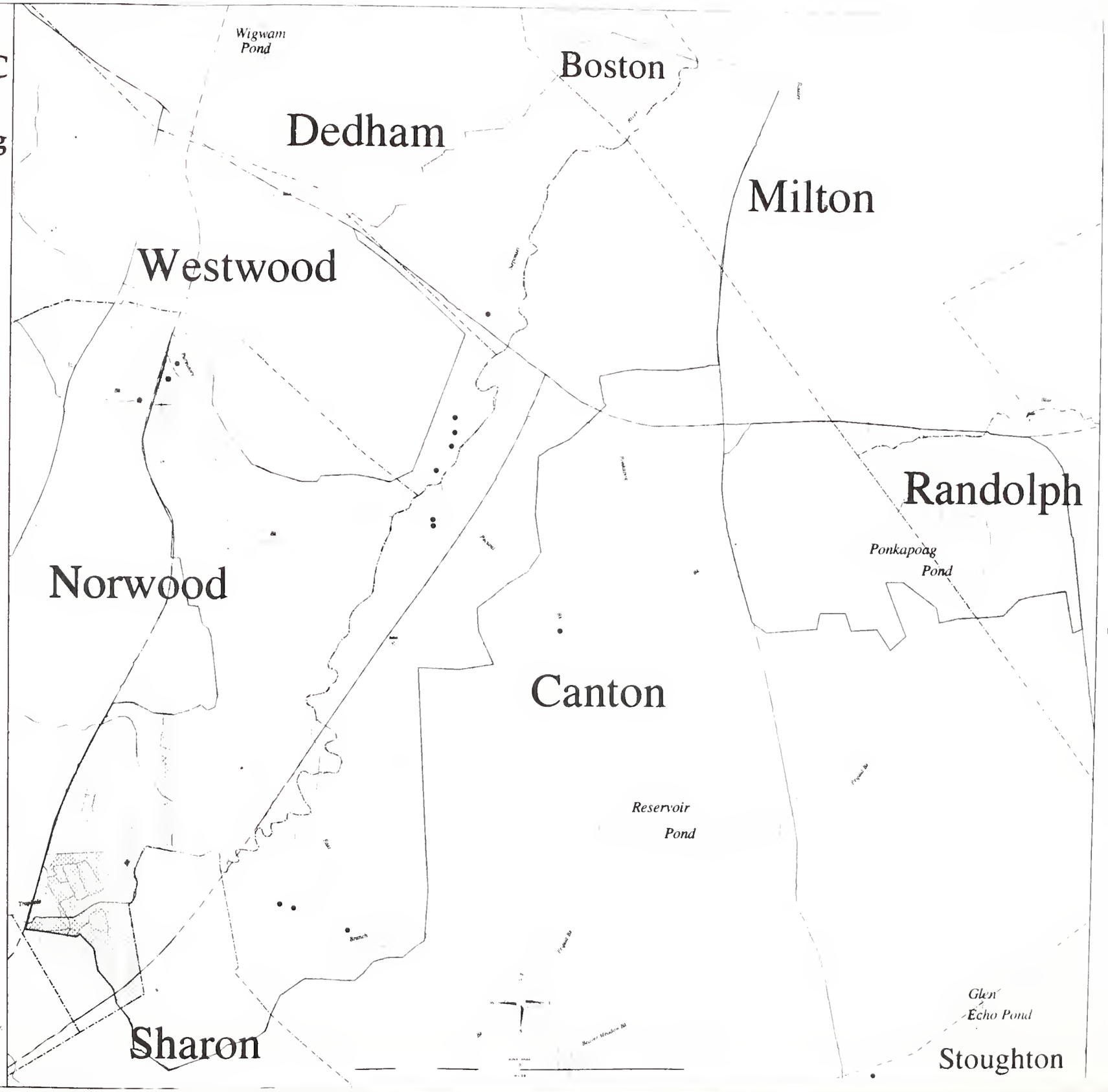
Data Sources:
Digital zoning coverages compiled by MAPC and the Central Transportation Planning Staff (CTPS). They are based upon community zoning maps dated as follows. Canton - 1996, Dedham - 1989, Milton - 1983, Norwood - 1990, Sharon - 1994, Westwood - 1993. Base map data provided by MassGIS. Wells data provided by MassGIS and edited by MAPC

MAPC

The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition or regulatory interpretation

Produced by the Metropolitan Area Planning Council GIS lab
60 Temple Place, Boston, MA 02111 (617)451-2770

Date: November 1996



1.5 Summary of Major Regional Projects

This section summarizes major regional projects that may have an impact on ACEC resources. Most of these projects are transportation related. The Fowl Meadow ACEC incorporates major transportation corridors and nodes, including Route 128, I-95, I-93, the Route 128/I-93 interchange, and an Amtrak and MBTA rail station and railway lines. The access to transportation services has fueled growth in the region, and the subsequent need to upgrade transportation services.

In a recent Environmental Notification Form Certificate, the Secretary of the Executive Office of Environmental Affairs emphasized the need for regional planning in the area surrounding the Route 128 rail station, as follows:

> ...Commonwealth agencies with a direct interest in the project area, in particular the Massachusetts Bay Transit Authority (MBTA) and the Massachusetts Highway Department (MHD), together with my own office, can and should play a leadership role in developing an areawide plan that balances transportation, landuse and environmental considerations. This should be done in cooperation with municipal authorities, private developers and environmental organizations. The project area includes highly sensitive resources that have long been recognized as deserving special protection through designations as a water supply protection area, an Area of Critical Environmental Concern (ACEC) and a pilot project area for the Commonwealth's Watershed Initiative. While valuable efforts have been made to control impacts from development to date, the additional development that is likely to occur could overwhelm current management and mitigation measures if a proactive and regional planning approach is not adopted soon.

One of the recommendations of this report is the formation of an ongoing group to help monitor and coordinate overall stewardship of the ACEC, working with the Neponset River Watershed Association, DEM's ACEC Program, MDC, the Three Rivers Interlocal Council, Friends of the Blue Hills, town boards and others. One of the major roles of such a group would be to monitor and comment on the several pending major projects in the ACEC.

1.5.1 Route 128 Station Expansion

The MBTA is upgrading the Route 128 commuter rail and Amtrak station and parking facility, which is located in Dedham and Westwood within the ACEC. Additional parking, equipped with stormwater runoff mitigation measures, is badly

needed. There is now unregulated parking in the ACEC next to the Neponset River. Several hundred vehicles now park in a small dirt lot on the east side of the railroad tracks and at the end of Greenlodge Street.

The facility upgrade will include a 2,700 space parking garage, using the same footprint as the existing 800 space surface lot. The station area will be improved, pedestrian access and circulation will be improved, and new high-level platforms will be constructed to accommodate high-speed trains.

This area is low-lying, flood-prone and in close proximity to the Neponset River and the Dedham-Westwood Water District's Fowl Meadow and White Lodge wells. MAPC recommends that design of the upgraded facility take into consideration the sensitive environmental nature of the site. Impacts from stormwater runoff should be minimized and the facility design should comply with the new DEP Stormwater Management Standards. The project should be flood-proofed and should not exacerbate flood conditions for existing developments. Environmental review and mitigation measures should ensure that the facility will not have adverse impacts on nearby water supply wells.

1.5.2 Improvements to Local Roadways

Town officials and developers want improved traffic conditions and better access between University Avenue, the train station, I-95 and Route 128. At the request of the Three Rivers Interlocal Council and others, the Central Transportation Planning Staff (CTPS) is conducting a study of traffic improvement alternatives on the roadways adjacent to, and in some cases connected to, Route 128, stretching from Route 1 to Route 24. These include Greenlodge Street, Canton Street, Dedham Street, Royall Street, Green Street, East Street, Blue Hill Drive, University Avenue, I-95, Route 138 and Ponkapoag Trail. The primary focus of the study will be the improvement of traffic on the local streets and access roads which connect the employment and residential areas throughout the corridor. Several alternatives will be studied, including rebuilding the Greenlodge Street bridge, providing new slip ramps to Route 128 and creating a frontage road.

Local opinion regarding the rebuilding of the Greenlodge Street bridge is divided. This bridge, which has been out of service for the last 20 years, traverses the railroad

tracks and connects Greenlodge Street in Canton with Blue Hill Drive in Westwood. Rebuilding the bridge will improve access and circulation, especially for emergency vehicles. There is local concern about the increase in traffic and the loss of parking for local residents. Some citizens and officials have requested that the bridge be restricted to pedestrian, bicycle and emergency vehicle traffic.

1.5.3 Railroad Electrification

The Northeast Corridor (Amtrak) is being electrified to provide faster service between Boston and Washington, DC The railroad right-of-way runs through the Fowl Meadow and the electrification project has some construction impacts. Right-of-way maintenance may also have impacts on the Fowl Meadow wetlands. The new track is almost completely installed, after which the poles for the electrical lines will be installed. Electrification should be completed in 1999. Train traffic is expected to increase significantly once electrification is completed and a third track may be needed within the next ten years to accommodate the additional passengers.

1.5.4 Route 128/I-95 Interchange Improvements

The MHD is proposing the reconstruction of the I-95/Route 128 interchange to upgrade safety. This reconstruction would involve replacing the inner loop of the northeast quadrant which connects I-95 northbound traffic with I-95/Route 128 northbound. A two-lane directional roadway is proposed to extend from the northbound lanes of I-95, westward over the outer loop of the northeast quadrant, to connect with an existing abandoned ramp onto northbound I-95/Route 128.

The proposed project would have wetland impacts and might affect an existing access point to the Fowl Meadow (an unused bridge over Route 128). Advocates for access to the Fowl Meadow should work with transportation officials to try to incorporate pedestrian access into the interchange plans.

1.5.5 Route 128 Widening

The Massachusetts Highway Department is proposing to increase capacity on a 13.7 mile stretch of Route 128 between Route 24 in Randolph and Route 9 in Wellesley. MHD is considering adding a travel lane in the median in each direction, for use as

either general purpose lanes or for exclusive use by high-occupancy vehicles (HOVs). A Draft Environmental Impact Report (DEIR) for the project was released in June 1996 (EOEA #5072) and the Final EIR is expected in the spring of 1997.

The project would entail adding two lanes to Route 128 through its entire crossing of the ACEC. The Route 128 bridge over the railroad tracks in Dedham, close to the new Fowl Meadow well, would have to be widened. The DEIR states that roadway runoff would be increased by approximately 16 percent due to the increased paved surface. Pollutants typically found in highway runoff include oil, hydrocarbons, lead, zinc, copper and salt. Subsequent to publication of the DEIR, the DEP issued Stormwater Management Standards that apply to road construction. These guidelines require, among other things, that stormwater discharges to wetland areas be treated before discharge. According to MHD staff, the agency intends to comply with the new standards and is evaluating all existing stormwater outfalls to see how the standards can be met.

Review of the project should assess whether the net benefits of this large and expensive project would outweigh the potentially significant impacts on the ACEC and other environmental resources. If this project is constructed it should seek to improve current conditions by constructing Best Management Practices that minimize impacts on wetlands and water resources in the ACEC.

1.5.6 Neponset Valley Relief Sewer

The Neponset Valley Relief Sewer was constructed by the Massachusetts Water Resources Authority (MWRA) to provide much needed additional sewer capacity to the area. The relief sewer should eliminate sewer surcharging problems. The project should improve health and environmental conditions and have a very positive impact on water quality in the Fowl Meadow.

The sewer operates as a force main between Signal Hill in Canton and Paul's Bridge in Milton and involved the construction of a pump station in the Signal Hill area of Canton. Indian Lookout is an important archaeological site on Signal Hill and there are serious concerns about future development proposals, especially now that the area is serviced by an improved road and utilities (see further discussion in Section 2.2.3).

The sewer main follows the course of the Burma Road trail through the Fowl Meadow. Friends of the Blue Hills and a member of the Milton Conservation Commission have voiced concern about whether the road was constructed in a manner sufficient to provide safe passage for MWRA trucks (used to service the main and the pump station), emergency vehicles and fire trucks. The road is now flooded and access is not feasible. The area has been hydroseeded, however, and once plantings are established much of the flooding and erosion problems may be resolved.

1.5.7 MDC Activities and Resource Management Plan

Metropolitan District Commission (MDC) lands within the ACEC include the northern portion of Fowl Meadow (918 acres), the former Canton Airport property (335 acres) and Ponkapoag Pond (1,369 acres). These lands are managed by the MDC as part of its Blue Hills Reservation. (MDC land in the Fowl Meadow is also referred to as the Neponset River Reservation.) Collectively, the MDC lands include 2,622 acres, or 31 percent of the ACEC land area.

Facilities within the ACEC include the Ponkapoag Golf Course, Fisherman's Beach, the YMCA and AMC Camps, Ponkapoag Boardwalk, the Burma Road trail in the Fowl Meadow and numerous trails in the Ponkapoag Pond area. MDC draws water from Ponkapoag Pond for irrigation of the Ponkapoag Golf Course. Irrigation and drainage improvements are proposed for the golf course and are the subject of a separate environmental impact report.

Consultants for the MDC are currently developing a Resource Management Plan for MDC land within the ACEC. The consultants have met with community officials and watershed groups regarding the plan. The final draft will be submitted to the MEPA (Massachusetts Environmental Policy Act) office of the Executive Office of Environmental Affairs (EOEA) by April 1997.

Tasks to be conducted for the Resource Management Plan include:

- developing a revised list of goals and objectives for MDC property and facilities within the Fowl Meadow and Ponkapoag Bog ACEC;
- GIS mapping of natural resources, recreational uses and MDC facilities;

- identifying land uses and human activities, including a review of recreational facilities, historic and archaeological sites and water quality issues;
- documenting planned development and maintenance activities; and
- outlining a permitting compliance process and public coordination strategy.

A primary objective of the Resource Management Plan is to streamline the permitting and environmental review process for projects proposed within MDC lands in the ACEC. MEPA regulations require filing of an Environmental Notification Form (ENF) for all state planning actions within an ACEC. MDC's objective is for the Resource Management Plan to lay out a plan and establish guidance for all MDC activities so that most individual actions will not require MEPA review.

Following an internal review by the EOEA Working Group, a Draft Resource Management Plan will be submitted to MEPA as an Environmental Notification Form. A scoping session will be held to decide if the Resource Management Plan has addressed the necessary issues, if the document can serve as a guidance document, and whether or not an EIR is needed for the Resource Management Plan.

2.0 Canton: Inventory and Assessment of Land Use and Regulations

2.1 Major Findings and Recommendations for the Canton ACEC

The box below lists the major findings and recommendations relative to the portion of the ACEC within the Canton municipal boundary.

Canton: Major Findings and Recommendations

Major Findings

- About one-third of the Canton ACEC, including wetlands and floodplains, zoned for industrial development.
- Roughly 30 percent of Canton ACEC located in groundwater protection district.
- Groundwater protection district does not include inter-community areas (e.g., Zone II for Dedham-Westwood Water District's new Fowl Meadow well).
- Indian Lookout archaeological site threatened by development.
- Pending major developments in, and directly adjacent to, ACEC.
- Existing and proposed water withdrawals and out-of-basin transfers through MWRA sewer.
- Water withdrawals for irrigation of MDC golf course
- Hazardous waste sites (especially Cumberland Farms and Indian Line Farm)
- Stormwater runoff from I-95 and Route 128
- Stormwater runoff from state salt storage facility
- Pending regional projects.
- Excellent wetlands regulations, including no-build zone, stormwater and erosion controls.

Major Recommendations

- Monitor remedial action for Cumberland Farms hazardous waste site and obtain more information about upgradient groundwater contamination.
- Rezone some industrially-zoned areas to less intensive use.
- Adopt ACEC bylaw or regulation.
- Adopt cluster zoning.
- Expand groundwater protection district to include inter-community Zone II areas.

Canton: Major Findings and Recommendations (cont'd.)

- Improve environmental/water quality protection measures in zoning and subdivision (8/78 version) regulations.
- Begin using DEP Stormwater Management Standards.
- Maximize on-site recharge.
- See general recommendations in Chapter 8.

2.2 Current and Potential Future Land Use in the Canton ACEC

2.2.1 Brief Overview of Water Resources

Water Bodies within the ACEC

Neponset River; East Branch of the Neponset (Canton River); Pecunit and Ponkapoag Brooks, Ponkapoag Pond. Except for a very small piece of the town, all of the land area within Canton drains to the Neponset River.

Water Supplies in the ACEC and Out-of-Basin Transfers

Canton has 5 existing wells and one proposed well within the ACEC. Canton is addressing wetlands issues with the Army Corps of Engineers for the proposed well within the ACEC. Two of the existing wells (#2 and #3) have been inactive for 10 years due to elevated levels of manganese (a natural metal that causes odor and staining problems), and concern about drawing contamination into the well from a hazardous waste site on the Cumberland Farms property.

About 68 percent of the Canton population is sewered to the MWRA system, so a large amount of the water that is withdrawn from the Neponset basin is not recharged to the basin but diverted to Boston Harbor.

2.2.2 Current Land Use

MacConnell Land Use Data

MacConnell land use data for 1991 were available for Canton and are shown on Table 2-1 and on Map 1. According to the 1991 data, of the 3,573 acres in the Canton ACEC, two-thirds are undeveloped and one-third is developed.

Table 2-1
Canton 1991 MacConnell Land Use in the ACEC

Land Use Category	Area (Acres)	Percent
Undeveloped Land Uses		
Agriculture	105.6	3.0%
Forest	1259.9	35.3%
Wetland	793.5	22.2%
Open Land/Urban Land	89.6	2.5%
Water	119.4	3.3%
Total Undeveloped Land Uses	2368.0	66.3%
Developed Land Uses		
Residential: multi-family to 1/2 acre lots	180.7	5.1%
Residential: larger than 1/2 acre lots	261.7	7.3%
Commercial	66.1	1.8%
Industrial	141.1	3.9%
Transportation	226.2	6.3%
Recreation	323.0	9.0%
Mining & Waste Disposal*	6.4	0.2%
Total Developed Land Uses	1205.2	33.7%
Total land use	3573.2	100.0%

Source: MacConnell land use data is developed by Resource Mapping, Department of Forestry, University of Massachusetts, Amherst and was provided by MassGIS.

***Note:** The 6.4 acres shown as mining/waste disposal in Table 2-1 and on Map 1 are an error in the MacConnell database, which incorrectly characterized a construction area for the MWRA sewage pumping station as mining/waste disposal. There is no real mining or waste disposal in the ACEC.

Part of both the Fowl Meadow and Ponkapoag Bog ACECs are located within Canton. Land use in the Fowl Meadow ACEC includes lots of wetlands and floodplain area, low-density residential development, a golf course, transportation

corridors (Route 128 and I-95), some older industrial areas and scattered areas of commercial development.

Burma Road, a hiking trail and right-of-way for the Neponset Valley Relief Sewer, traverses the ACEC in a north-south direction. The skyline footpath starts at the Route 128 end of the Burma Road and extends 12 miles to Quincy. The MDC owns a substantial amount of the Fowl Meadow area in Canton.

The Green Street area in the Canton ACEC is an area of very low-density residential estates. Many of the Green Street estates are protected from subdividing by deed restrictions, although there is occasional development.

A large portion of the Fowl Meadow area east of I-95 is the old Canton airport. There are many defunct industrial buildings on the property, including old airplane hangars and other industrial uses. There may also be some hazardous waste contamination on the site, according to preliminary site investigations conducted by the MWRA. The property is now in tax title and is unbuildable because of the vast amount of wetlands and floodplain on the site. Upland areas are generally inaccessible. The MDC has purchased approximately 300 acres in this area which will enable it to become public open space.

Most of the land within the Ponkapoag Bog ACEC is owned by the MDC. In addition to forested land used for passive recreation, land uses within the Ponkapoag Bog ACEC include the MDC golf course and the AMC and YMCA day camps. There is a very small amount of residential land use within the Ponkapoag Bog ACEC.

Current Issues and Concerns

The Fowl Meadow ACEC is bisected by two major highways: I-95 running north-south and Route 128 running east-west. Road runoff, including road salt, sand, hydrocarbons, metals and other contaminants most likely has a significant adverse impact on the ACEC.

The Massachusetts Highway Department (MHD) operates a salt storage facility at the end of the I-95 stub in Canton. This is a past and a potential source of salt and sand into adjacent wetlands.

Hazardous materials and waste from current and past industrial uses is a concern and may be affecting ACEC resources. The Indian Line Farm federal Superfund site is located within the Ponkapoag Bog ACEC, on land owned by the MDC. The site includes areas that could be prime recreational sites but are closed because of hazardous waste.

Cumberland Farms, located on Dedham Street in Canton adjacent to Pecunit Brook and just west of I-95, has been a significant concern with regard to hazardous materials. The property is a state-listed confirmed hazardous waste site due to groundwater contamination caused by gasoline leaks from two underground storage tanks. This contamination is located in relative proximity to water supply wells in Canton (wells 2 and 3) and Westwood (White Lodge wells) and, according to the Phase III Remedial Action Plan, poses a significant risk to future off-site residents.

Cumberland Farms is installing a treatment system for the gasoline plume but a second groundwater contamination plume that was identified during site work will not be remediated because it originates upgradient of the Cumberland Farms site. The remediation plan is estimated to cost approximately $450,000 and take five years to complete.

With regard to existing operations at the site, truck washing was cited as a concern. Trucks are washed on the site (possibly using degreaser) and the wash water is discharged into Pecunit Brook. The property parking lots flood in spring and this may have water quality impacts on Pecunit Brook.

There are other old industrial sites in town with hazardous waste problems, in particular several sites with known PCB contamination from past manufacturing by Tobe Deutschmann and the Tandy Corporation. Some of these sites border on the Neponset River, and although some sites are located outside of the ACEC, all surface water drainage in Canton flows toward the Neponset River and the Fowl Meadow. A fire at one site required evacuation of about 400 people, and left dioxin contamination in the soils.

According to a member of the Canton Conservation Commission, elevated levels of lead have been identified in Ponkapoag Brook near the MDC golf course. Possible

sources might include contamination from leaded gasoline or the possible use of lead arsenate as an insecticide at the golf course. The Algonquin Gas line runs close to Ponkapoag Pond and may be expanded or replaced in the future, which could entail significant construction impacts. The use of water from Ponkapoag Pond for irrigation of the MDC golf course is a major issue that is being addressed in the MDC's Resource Management Plan and a separate EIR.

A Planning Board member questioned whether the practice used by some condominium associations of dumping plowed snow into wetlands could be contributing salt and other pollution into wetland areas.

2.2.3 Future Development Concerns

As shown on Map 2: Underlying Zoning, a very large portion (32 percent) of the ACEC in Canton is zoned for industrial development. Map 1: 1985/1991 MacConnell Land Use shows that a substantial amount of the undeveloped and industrially-zoned land is wetland. Much of this land, in fact, is owned by the MDC as part of the Neponset River Reservation.

MAPC recommends that Canton consider rezoning industrially-zoned areas of the Fowl Meadow to more properly reflect their intended use. A general discussion of rezoning options is contained in Section 8.2.3.

Except for a 3-acre commercially zoned area, the remainder of the Canton ACEC is zoned for residential development. Table 2-2, in Section 2.3.1, provides a breakdown of zoning for the Canton ACEC.

A discussion with a member of the Canton Planning Board identified several areas within the ACEC that are, or could be, the subject of development proposals. These areas are discussed in below, organized by their location within the ACEC.

South of 128/West of I-95. The area in Canton for which the greatest concern was noted was for the Indian Lookout archaeological site located in the Signal Hill area. Indian Lookout is an important archaeological site that includes a Native American encampment and lookout site. According to the Friends of the Blue Hills, this is one of the last archaeological sites in the area that remains intact. This site is integrally

related to other archaeological sites in the Fowl Meadow and Blue Hills that document human habitation in the area for thousands of years. Some archaeological study of the Indian Lookout site has been conducted, including carbon dating of artifacts.

The Indian Lookout/Signal Hill area is under intense development pressure. The area is zoned for industrial development and is located in fairly close proximity to the University Avenue area (a major area of commercial and industrial development). The area is now served by electricity and water, and the access road is greatly improved, due to utility upgrades made by the MWRA during construction of the new pumping station for the Neponset Valley Relief Sewer.

The Neponset River Watershed Association cautioned that the site was threatened "fairly imminently" with development and questioned whether the site should be put at the top of the priority list for land purchases in the area. MAPC recommends that the Planning Board consider whether the area is zoned appropriately and take measures now and in the future to ensure that the important archaeological sites and other resources of the ACEC are protected. General recommendations on rezoning areas of the ACEC are contained in Section 8.2.3.

South of 128/East of I-95.

The portion of the ACEC just south of Route 128 and East of I-95 is bounded on the east by Elm Street. As shown on the land use map (Map 1), there is some residential development in this area. The area is zoned for medium density residential development (between 1/2 and 1-acre lots) and there are a few additional potential development sites.

Moving south from the above-mentioned area to Chapman Street and west of the railroad tracks, there is an area of residential development. As of March 1996, there was a proposal for a residential subdivision that would expand existing residential development north of Everett Street up to the railroad tracks. The proposal would require rezoning some industrially-zoned property to residential and was to be voted on at the spring 1996 town meeting. The size of the proposed lots is between 21,000 and 60,000 square feet. Canton does not have cluster zoning, which would provide more flexibility to avoid sensitive environmental resources.

North of 128. There is a large portion of industrially-zoned land that abuts the ACEC just north of Route 128. A small piece of this industrially-zoned land is located within the ACEC and is now used as a nursery. This property may be converted to industrial uses, specifically a 110-foot industrial office building and associated parking. Neighboring properties outside of, but adjacent to, the ACEC are also slated for redevelopment and expansion. In particular, Reebok is proposing to develop the Instron property which is outside of, but adjacent to, the ACEC. The property drains into the ACEC and stormwater runoff from a major development at this site could have potentially significant impacts.

In addition to the specific areas and proposals discussed in the above paragraphs, Section 1.5 discusses ongoing or pending major regional projects that will have an impact on the ACEC in Canton, including the proposed widening of Route 128, the railroad electrification project and the redevelopment of the Route 128 interchange/I-95.

Another issue which is more properly labeled an "opportunity" than a "concern," is that of improved access to ACEC resources. A former MDC official noted two areas in Canton which could provide access to the Fowl Meadow and Neponset River. The first access point, for foot traffic into the ACEC, is the bridge at the site of the old I-95 extension at Route 128. The bridge was used by MWRA during construction of the Neponset Valley Relief Sewer. Some upgrading, including parking, would be necessary. This bridge may be used as part of the proposed Route 128/I-95 interchange alignment (discussed in Section 1.5). Proponents of access will need to work with transportation officials to incorporate access into the plans. A second access point, for canoes, is at the MDC gate and road off Greenlodge Street. Access issues are being addressed in more detail in MDC's Resource Management Plan.

2.3 Municipal Land Use Regulations in Canton

Canton has set aside funds to update its Master Plan and upgrade the rules and regulations of the Planning Board.

2.3.1 Canton Zoning Bylaw

Use Regulations

There are seven underlying zoning districts within the Canton portion of the ACEC. Table 2-2 provides the number of acres, minimum lot area, and maximum building coverage requirements for each of the seven districts.

Site Plan Approval (sec. IVD).

Site plan approval is required for all new construction or expansions of non-residential buildings as well as for establishment of non-residential uses in buildings not previously used for such purposes. Site plans must show subsurface and surface drainage facilities.

Site plan regulations could be improved by including standards and guidance for prevention of water pollution. For example, the regulations include a special section on service stations and auto-related businesses. These businesses are "hot spots" for environmental contamination. Adding environmental design criteria to this section, could help ensure that future auto-related businesses integrate safeguards to protect environmental features. Criteria and standards should be consistent with the new DEP Stormwater Management Standards (see section 8.2.5) or other stormwater standards the town intends to use.

Table 2-2
Zoning Districts within the Canton ACEC

District	Map 2 Category	Acres in ACEC	Minimum Lot Area (sq. ft.)	Maximum Coverage by Buildings
Single Residence AA	LDR	1677.7	45,000	25%
Single Residence A	MDR	588.0	30,000	25%
Single Residence B	HDR	23.1	15,000	25%
Single Residence C	HDR	109.5	10,000	25%
General Residence	HDR	16.0	10,000	30%
Business	C	3.0	--	90%
Limited Industrial	I	440.4	--	40%
Industrial	I	715.6	--	50%
Total		**3573.3**		

Off-street Parking (sec. V).

Off-street parking regulations include language regarding landscaping, but not water quality protection.

Flood Plain District (Sec. III).

Canton has adopted two zoning overlay districts for protection of the floodplain: the Flood Plain District (Section IIIA) and the Federal Flood Plain District (Section IIIB). The Flood Plain District prohibits building within 150 feet of the center line of the Neponset River or within 75 feet of the center line of the Canton River, and requires a special permit from the Board of Appeals for other activities in the district. The Federal Flood Plain District focuses on ensuring that structures within the district are properly floodproofed and that activities within the floodway do not result in increases in flood levels of the 100-year flood.

Groundwater Protection District

The town of Canton adopted a groundwater protection overlay district at the spring, 1996 town meeting. This district provides protection for Canton's active wells nos. 4, 5, 6 and 7. It does not provide protection for inactive wells (nos. 2 and 3) or for inter-community water resource areas, particularly the Zone II for the Dedham-Westwood Water District's Fowl Meadow well, a large part of which extends into Canton.

Canton's bylaw follows state requirements and is similar to the MAPC model bylaw with respect to prohibited uses and uses requiring a special permit. Canton's groundwater bylaw requires that new uses with impervious surface greater than 15 percent or 2,500 square feet of any lot (whichever is greater) must provide a system for groundwater recharge that does not degrade water quality.

2.3.2 Canton Subdivision Regulations

Canton's subdivision regulations are in the process of being revised. The version reviewed for this report was dated August, 1978.

For the most part, Canton's subdivision regulations do not include standards or criteria for the protection of water quality and other environmental resources. There

is an overarching statement about protection of natural features (sec. 5.8), that reads: "Due regard shall be shown for all natural features, such as large trees, watercourses, scenic points, historic spots and similar community assets, which, if preserved, will add attractiveness and value to the subdivision." The removal of trees over six inches in diameter requires approval from the town.

One of the few environmental requirements is that "provisions must be made for outfalls of a drainage system to provide for sedimentation, erosion and safety" (sec. 5.223). There is no further description of how to meet these standards.

The drainage section of the regulations (sec. 5.2) could be upgraded to include water quality and to be more flexible to allow for alternative methods of stormwater control. For example, the regulations require that storm water "shall be directed to enter and discharge into the nearest natural water course" and that stormwater runoff within the subdivision "shall not be permitted to flow upon the surface for a longer distance than 300 feet before it enters the underground system" (sec. 5.23.1).

2.3.3 Canton Wetlands Bylaw and Regulations

The town of Canton has adopted a general wetlands protection bylaw. The Conservation Commission has adopted rules and regulations and a set of policies to implement the bylaw. All three documents are summarized below.

In addition, the Conservation Agent noted that the Commission does not allow the direct discharge of stormwater into any resource area. Treatment (such as sediment basins, oil/gas separators and catch basins with deeper sumps) are required prior to discharge. Discharges are prohibited within 30 feet of a wetland boundary, as part of the setback provisions of the Conservation Commission's Rules and Regulations.

Policies.

Conservation Commission policies place strict limitations on the removal or cutting of vegetation: "[N]o trees or other vegetation can be disturbed except those which are within the building foot print, the foot print of adjunct buildings and the associated grading of those buildings." Tree cutting plans must be approved by the Commission.

Concrete retaining walls are required along the 30-foot no-build zone and along the bordering vegetated wetland line.

Wetlands Bylaw (Article XV, General Bylaws)

Canton's wetlands bylaw controls activities likely to have a significant or cumulative effect on wetland values. The additional values protected by the Canton wetlands bylaw and regulations are (sec. 1; regulations sec. 1.01(2)):

- erosion and sedimentation control
- groundwater quality
- water quality in ponds
- recreation
- aesthetics
- agriculture
- aquaculture
- historic values

The additional resources covered by the bylaw are (sec. 1):

- land subject to inundation by groundwater
- vernal pools and their 100-foot buffer zone

Canton's bylaw contains fewer exceptions from regulation than the State Wetlands Protection Act (sec. 3). The bylaw authorizes the Commission to protect critical resources by requiring conservation restrictions, easements or other covenants, recorded in the deed and running with the land (sec. 10).

Conservation Commission Rules and Regulations

One of the most significant ACEC protection measures is the use of wetland setbacks. Canton's Conservation Commission Rules and Regulations prohibit activities, other than maintenance of existing structures, on land within 30 feet of any bank or bordering vegetated wetland, unless a variance is received. The regulations include

performance standards which must be met for a variance to be issued (2.10(3); 2.02(3)).

Plans submitted by project proponents must include methods to control erosion and sedimentation during and after construction, and the Commission may require submittal of a Sediment and Erosion Control Plan (5.03(2)(s). Plans must also include a discussion of the proposed project's effects on the wetland interests protected by the bylaw (5.03(2)(h).

Canton's regulations require the Commission to impose conditions setting limits on the quantity and quality of discharge from point sources (both open and closed channel) when such limits are necessary to protect the interests of the bylaw (sec. 1.05(6)(b)).

3.0 Dedham: Inventory and Assessment of Land Use and Regulations

3.1 Major Findings and Recommendations for the Dedham ACEC

The box below lists the major findings and recommendations relative to the portion of the ACEC within the Dedham municipal boundary.

Dedham: Major Findings and Recommendations

Major Findings and Issues

- Most of the Fowl Meadow wetlands in Dedham zoned for industrial development.
- Out-of-basin transfers through MWRA sewer.
- Stormwater runoff from I-95 and Route 128.
- Stormwater runoff from Stop & Shop facility.
- Impacts from pending regional projects.
- Excellent wetlands bylaw and regulations, including water quality standards, requirements for Best Management Practices and no-build zone.
- Major site plan review includes environmental impact assessment and environmental standards.

Major Recommendations

- Rezone some industrially-zoned areas to less intensive use.
- Maximize on-site recharge.
- Work with existing facilities to minimize impacts on ACEC resources.
- See general recommendations in Chapter 8.

3.2 Current and Potential Future Land Use in the Dedham ACEC

3.2.1 Brief Overview of Water Resources

Water Bodies in the ACEC

Neponset River, Sprague Pond.

Water Supplies in the ACEC and Out-of-Basin Transfers

Dedham and Westwood are served by the Dedham-Westwood Water District. The District operates four wells within the Fowl Meadow ACEC in Westwood and a fifth, located in the Dedham portion of the Fowl Meadow just north of Route 128, is being developed and will probably start supplying water in the spring of 1997. Despite its location near Route 128, this well is reported to have excellent water quality and to be potable without treatment.

The four Westwood wells in the ACEC are located in the University Avenue area, which is heavily developed with industrial uses. The area to the east of University Avenue is located within the ACEC. Two of the four Westwood wells were shut down in 1978 due to contamination with volatile organic compounds. The wells were returned to service after a treatment plant was built. The Massachusetts Department of Environmental Protection (DEP) has noted that the Westwood wells are some of Massachusetts' most vulnerable with respect to the threat of industrial contamination.

The District also operates the Bridge Street wells, in the Charles River Basin, in Dedham.

About 94 percent of the Dedham population (including all of the area within the ACEC) and 78 percent of the Westwood population are sewered to the MWRA, so most of the wastewater withdrawn from the Neponset basin is transferred out of the basin and is not recharged to the aquifer.

3.2.2 Current Land Use

Land Use Summary

1985 is the most recent year for which MacConnell land use data are available for Dedham. These data are shown numerically in Table 3-1 and graphically on Map 1. According to the 1985 data, of the 666 acres in the Dedham ACEC, 52 percent are undeveloped and 48 percent are developed.

Developed land uses in the Dedham portion of the ACEC include: residential uses in upland areas; an industrial land use on the Boston-Dedham border (Stop & Shop warehouse facility); Route 128 which parallels Dedham's southern boundary with

Westwood, and a railroad right-of-way which traverses the wetlands near the Canton-Dedham border. Almost half of the ACEC is undeveloped and most of this area is undevelopable wetland and/or floodplain. Most of the undeveloped land is owned by MDC or the town.

Table 3-1
Dedham 1985 MacConnell Land Use in the ACEC

Land Use Category	Area (Acres)	Percent
Undeveloped Land Uses		
Forest	58.1	8.7%
Wetland	278.4	41.8%
Open Land/Urban Land	7.2	1.1%
Water	2.2	0.3%
Total Undeveloped Land Uses	345.8	51.9%
Developed Land Uses		
Residential: multi-family to 1/2 acre lots	242.4	36.4%
Residential: larger than 1/2 acre lots	3.3	0.5%
Industrial	16.5	2.5%
Transportation	57.8	8.7%
Total Developed Land Uses	320.1	48.1%
Total Land Use	665.9	100.0%

Source: MacConnell land use data is developed by Resource Mapping, Department of Forestry, University of Massachusetts, Amherst and was provided by MassGIS.

Current Issues and Concerns

Residents of Dedham are not aware of and do not use the land within ACEC in Dedham. Most of the public ACEC land in Dedham is inaccessible, wet, and not good for hiking. There are some problems with dumping around the edge of the

ACEC, despite "no dumping" signs. The town owns land around the edge of the ACEC, so the dumping is primarily a town problem.

The Stop & Shop facility, which straddles the Boston-Dedham border, is the only major commercial or industrial facility in the Dedham portion of the ACEC. This is a warehouse and trucking facility. Sampling conducted in 1972 by Jason Cortell Assoc. identified significantly elevated levels of fecal coliform at the Stop and Shop site (approximately 4400/100 ml).

Much work has been done to improve the situation at the Stop and Shop warehouse facility over the past two years. Such improvements include removal of underground storage tanks and reconstruction of the parking area to ensure that any runoff will flow through sumped catch basins with oil/gas separators prior to discharging into the wetlands. Stop and Shop has also constructed a truck washing facility that will recycle approximately 90 percent of the water used in vehicle washing. All waste water from this facility will be routed into the sewer system. This is a marked improvement over the previous mobile truck washing system which allowed for all waste water to run off into the wetlands.

3.2.3 Future Development Concerns

As shown on Map 2: Underlying Zoning, a very large portion (43 percent) of the ACEC in Dedham is zoned for industrial development. Map 1: 1985/1991 MacConnell Land Use shows that a substantial amount of the undeveloped and industrially-zoned land is wetland. Much of this land is owned by the MDC as part of the Neponset River Reservation. Dedham's open space plan shows the MDC-owned area as protected open space.

MAPC recommends that Dedham consider rezoning industrially-zoned areas of the Fowl Meadow to more properly reflect their intended use. A general discussion of rezoning options is contained in Section 8.2.3.

Except for a 2.5-acre commercially zoned area, the remainder of the Dedham ACEC is zoned for residential development of less than 20,000 square foot per lot. Table 3-2, in the following section on Dedham regulations, provides a breakdown of zoning for the Dedham ACEC.

The Dedham Town Planner stated that there is not likely to be much future change in land use in Dedham within the ACEC. It is possible that a few more residential lots could be developed. It is also possible that the Stop & Shop property could be redeveloped in the future.

As discussed in the section on major regional projects (Section 1.5), several pending projects will have an impact on the ACEC in Dedham, including the proposed widening of Route 128, the railroad electrification project and the redevelopment of the Route 128 train station.

3.3 Municipal Land Use Regulations in Dedham

3.3.1 Dedham Zoning Bylaw

Use Regulations

There are five underlying zoning districts within the Dedham portion of the ACEC. Table 3-2 provides the number of acres, minimum lot area, and maximum lot coverage requirements for each of the five districts.

Table 3-2
Zoning Districts within the Dedham ACEC

District	Map 2 Category	Acres in ACEC	Minimum Lot Area (sq. ft.)	Maximum Lot Coverage
Single Residence B	HDR	291.0	12,500	30%
General Residence	HDR	86.2	7,500*	30%
Local Business	C	2.5	12,500	40%
Limited Manufacturing A	I	252.6	43,560	50%
Limited Manufacturing B	I	33.6	43,560	50%
Total Acres		**666.0**		

* Lot requirements for multi-family units differ.

Site Plan Review (sec. VIII-3 and 4).

Dedham's zoning bylaw includes provisions for Minor Site Plan Review (sec. VIII-3) and Major Site Plan Review (sec. VIII-4). Applicants for Major Site Plan Review must submit an environmental impact assessment. The assessment must include or discuss the following elements:

- assessment of existing and expected post-development environmental conditions, including water quality, pollution of groundwater, damage or threat to wetlands, flood plains, plant and animals;
- the potential for erosion or sedimentation and proposed or existing control measures;
- effects on groundwater supply, streams, and water bodies;
- effects on unique or valuable vistas;
- effects on symbiotic ecological relationships of animal and plant communities;
- compatibility of the project with existing and future natural and manmade environment;
- snow removal, maintenance of landscaped and paved areas;
- off-site environmental impacts;
- drainage; and
- pre-and post-development drainage calculations for 10 and 100 year storm.

The zoning bylaw includes required and recommended environmental standards which applicants must meet. Required environmental standards include the following:

- the proposed development shall not increase the potential for sedimentation, erosion, or flooding, raise the water table to an appreciable extent, or increase the rate of runoff from the site;
- no unique environmental features, habitats or vistas shall be endangered or destroyed;
- mitigation measures must be taken to minimize any unavoidable harmful impacts.

Recommended environmental standards for Major Site Plan review include recharging uncontaminated water to the ground and minimizing discharges to public storm and sanitary sewers, where possible.

Floodplain Zoning (sec. II-5).

The Dedham zoning bylaw creates a Flood Plain zoning overlay district. Any work within a Flood Plain District requires a special permit from the Board of Appeals. The bylaw specifies permitted and prohibited uses in the district.

Some properties within the ACEC are also likely to be subject to the minimum cellar or floor grade elevation requirements, specified in section V-5 of the bylaw.

Aquifer Protection District (sec. II-6)

The town of Dedham expanded its Aquifer Protection District at the April 1997 town meeting to include the Zone II for the Dedham-Westwood Water District's new Fowl Meadow well. Most of the Fowl Meadow ACEC in Dedham is located within the Aquifer Protection District.

The Zone II for the Fowl Meadow well extends into four towns: Dedham, Canton, Westwood and Norwood. Only about 25 percent of the Zone II is located in Dedham.

Dedham's Aquifer Protection District bylaw generally follows state requirements and the MAPC model bylaw with respect to prohibited uses and uses requiring a special permit. Land uses that will render impervious more than 25 percent of a lot surface must employ a system for artificial recharge of precipitation that will not result in groundwater pollution.

Activities that require a special permit must comply with several conditions, including no adverse short- or long-term impact on the aquifer or recharge area and no adverse affect on the quality or quantity of an existing or potential water supply.

Parking Regulations (sec. VIII).

Section B(3) of the parking regulations requires that contaminated surface water runoff may not be discharged directly into a wetland or water body without the specific approval of the Conservation Commission. The Conservation Commission

has adopted strong standards to protect water quality from contaminated runoff (see section 3.3.3).

3.3.2 Dedham Subdivision Regulations

Drainage Calculations (sec. 5.7.5).

Dedham's' Subdivision Regulations requires that the definitive subdivision plan include drainage analysis and calculations for the 10-year and 100-year storm events under pre- and post-development conditions. Unless the Planning Board specifies otherwise, drainage facilities must be designed so as not to increase appreciably the runoff to downgradient areas from a 10-year or 100-year storm event (sec. 6.3.1).

Design Standards and Required Improvements (sec. VI).

This section contains general language requiring consideration of important environmental features:

> Overall, subdivisions shall be designed to blend harmoniously with the existing natural environmental and manmade improvements. Change in the natural topography of the area, removal of healthy trees and other vegetation, removal of runoff-absorbing surface soils and groundcover, and diversion or draining of streams and wetlands shall be kept to a minimum. Buffer strips and measures for the protection of ecological, visual, and historical assets shall be provided as a matter of good design, even when not explicitly required by these Rules and Regulations. It shall be the policy of the Board to encourage easements or reservations for the protection of such assets, and to consider reuses for waivers from these Rules and Regulations to permit sensitive design and minimize destruction of valuable features *(sec. 6.1).*

3.3.3 Dedham Wetlands Bylaw and Regulations

Dedham Wetlands Bylaw

Dedham's wetlands bylaw controls activities deemed to have a significant or cumulative effect on wetland values. The additional values protected by the Dedham bylaw (sec. 1(a)) are:

- erosion and sedimentation control;
- recreation;
- aesthetics;

- agriculture; and
- aquaculture.

Additional resource areas protected by the bylaw (sec. 3) are:

- vernal pools;
- reservoirs; and
- land subject to inundation by groundwater or surface water.

Dedham Conservation Commission Rules and Regulations

The Dedham Conservation Commission is presently considering the adoption of specific rules and regulations regarding work within any ACEC wetland or buffer area. These regulations will impose stricter restrictions than those associated with other wetland areas.

The Dedham Conservation Commission has made a concerted effort to protect wetlands, groundwater and water resources in the town from stormwater pollution. In April 1996, the Commission revised its regulations to include water quality standards and Best Management Practices for projects that drain to resource areas. These regulations are included as Appendix A.

Buffer Zone. The rules and regulations presume that the 100-foot wetland buffer zone is relevant to the protection of wetland resource areas. The regulations specify a minimum depth of Undisturbed Buffer Area from the edge of the resource area based on a formula which takes into account the average slope across the buffer zone and the land use. The size of the buffer increases with slope and the intensive nature of the land use. The buffer is also increased for areas which contain USDA NRCS Hydrologic Group "D" soils (very poorly drained). If a lot is already developed beyond the Undisturbed Buffer Area that would be calculated using the formula, the existing limit of development serves as the depth of the buffer zone. Wetland or floodplain replication or restoration areas and their associated grading and landscaping may be located in the Undisturbed Buffer Area.

Vernal Pools. The rules and regulations require specified setback distances from all documented and presumed vernal pools (50 feet from the edge of clearing/landscaping and 75 feet from the edge of man-made structures).

Stormwater Management. Projects which involve the use of underground drainage structures or which involve more than 5,000 square feet of land which drains toward a Resource Area require drainage calculations prepared by a licensed Professional Engineer. Multi-family residential, commercial and industrial projects that involve the construction of access roads or parking lots also require drainage calculations.

Calculations must be performed for pre- and post-development conditions and storms of 2, 10, 25 and 100-year frequency events must be analyzed. Detention/retention systems must be designed to achieve a zero increase in peak runoff rate between pre- and post-development conditions for all four storm events (unless it can be demonstrated that an increased runoff rate will not have a detrimental effect on surrounding and downstream properties). Projects which discharge runoff directly into 100-year Floodplain Districts must demonstrate a zero increase in stormwater runoff volume for the 100-year frequency storm. Detention/retention basins must be designed based on a 100-year frequency storm. The rules and regulations include other drainage design criteria to be utilized for sizing drainage system components.

Maintenance of Drainage Structures. Any project involving the use of drainage structures, including swales and ponds, must include a maintenance plan that is designed to ensure that water quality standards are met throughout the year.

Water Quality Standards and Best Management Practices. The Conservation Commission's rules and regulations include water quality standards and Best Management Practices (BMPs) to achieve these standards. These standards and BMPs are based on and consistent with draft stormwater standards adopted by the Massachusetts Stormwater Advisory Committee (see section 5.15). The water quality standards include the following:

- New stormwater conveyances (outfalls/discharges) must not discharge untreated stormwater directly into or cause erosion in wetland resource areas, vernal pools, or the 100-foot buffer zone to these areas.
- Existing stormwater conveyances must be modified to comply with this regulation where deemed practical by the Conservation Commission, such as during redevelopment of a site.

- Stormwater management systems associated with new conveyances must be designed to remove 80 percent of the average annual load of total suspended solids based on proposed post-development conditions.
- The first inch of runoff from all impervious surfaces shall be retained and treated by the stormwater management system.
- The Commission may require additional stormwater management for projects which may generate higher potential pollutant loads, such as service stations, convenience stores, fast food restaurants or other projects that involve the servicing of motor vehicles or the generation of a high volume of vehicle trips.
- Erosion and sedimentation controls are required as part of any proposed construction or earthwork activities. An erosion and sedimentation control plan is required as part of the Notice of Intent.

Groundwater Recharge. The annual groundwater recharge under post-development conditions must be approximately equal to or greater than the annual groundwater recharge under pre-development conditions. Soils at infiltration points must be investigated and confirmed for adequate permeability.

Additional requirements for New and Existing Drainage Structures: All drainage structures located in areas subject to the Commission's jurisdiction must meet the following standards:

- All catch basin grates must be etched with the following statement: "Water from this catch basin discharges into [name of water body or water way]. Please do not dispose of waste oils or chemicals in this structure."
- All proposed drainage systems must include oil and gasoline separation chambers, and all existing drainage systems must be upgraded to include such chambers, prior to discharging into any wetlands, water bodies, or municipal drainage system.

4.0 Milton: Inventory and Assessment of Land Use and Regulations

4.1 Major Findings and Recommendations for the Milton ACEC

The box below lists the major findings and recommendations relative to the portion of the ACEC within the Milton municipal boundary.

Milton: Major Findings and Recommendations

Major Findings and Issues

- Stormwater runoff from Route 138.
- Substandard on-site sanitary waste disposal (cesspools).
- Potential future development of an elderly housing complex.
- Wetland regulations include undisturbed buffer zone.

Major Recommendations

- Ensure development of elderly housing complex protects critical ACEC resources.
- Adopt ACEC bylaw or regulation.
- Begin using DEP Stormwater Management Standards.
- Include environmental/water quality protection measures in site plan and special permit criteria.
- Consider program to inspect, pump and upgrade on-site wastewater disposal systems.
- See general recommendations in Chapter 8.

4.2 Current and Potential Future Land Use in the Milton ACEC

4.2.1 Brief Overview of Water Resources

Water Bodies in the ACEC

Neponset River; Blue Hill River; Kennedy Brook.

Water Supplies in the ACEC and Out-of-Basin Transfers

Milton is entirely served by the MWRA water supply system and is about 90 to 95 percent served by the MWRA wastewater system. Much of the ACEC area within

Milton is not sewered, which means that there is a net gain of wastewater in this area of the basin since the source water originates from outside the basin.

4.2.2 Current Land Use

Land Use Summary

1985 is the most recent year for which MacConnell land use data are available for Milton. These data are shown numerically in Table 4-1 and graphically on Map 1. According to the 1985 data, of the 414 acres in the Milton ACEC, two-thirds are undeveloped and one-third is developed.

Table 4-1
Milton 1985 MacConnell Land Use in the ACEC

Land Use Category	Area (Acres)	Percent
Undeveloped Land Uses		
Agriculture	33.9	8.2%
Forest	163.0	39.4%
Wetland	65.4	15.8%
Open Land/Urban Land	14.2	3.4%
Total Undeveloped Land Uses	276.5	66.8%
Developed Land Uses		
Residential: larger than 1/2 acre lots	108.8	26.3%
Commercial	1.2	0.3%
Transportation	19.5	4.7%
Recreation	7.7	1.9%
Total Developed Land Uses	137.2	33.2%
Total Land Uses	413.7	100.0%

Source: MacConnell land use data is developed by Resource Mapping, Department of Forestry, University of Massachusetts, Amherst and was provided by MassGIS.

The ACEC within Milton is bound by the Neponset River on the west, Route 138 on the east and the Milton-Canton line on the south. An MDC road, the Neponset Valley Parkway, traverses the ACEC in an east-west direction. The northern boundary of the ACEC is Paul's Bridge, which crosses the Neponset River at the intersections of Milton Street, Neponset Valley Parkway, and Brush Hill Road. Paul's Bridge forms the natural northern boundary of the Fowl Meadow wetland system. The high- and medium-yield aquifer underlying the Fowl Meadow does not extend beyond Paul's Bridge.

Paul's Bridge is an historic site. The bridge was originally constructed in the 18th century and was the first site in the vicinity of the Blue Hills to win national recognition for its historic value. Paul's Bridge was designated a National Historic Landmark and placed on the National Register of Historic Places in 1972, and was designated a Special Place in Massachusetts in 1986. The Paul's Bridge area is also one of the few access points to the Burma Road trail, which runs through the Fowl Meadow.

Predominant land uses within the Milton ACEC are undeveloped wetland (most of which is owned by the MDC), undeveloped forested land, and low-density residential. Residential uses include a nursing home, which is one of the few uses in the Milton ACEC with a sewer connection. The 1985 MacConnell land use data categorized 34 acres of the ACEC as land in agricultural uses (crop land and pasture). There are no commercial or industrial uses within the Milton ACEC.

Current Issues and Concerns

Road runoff from Route 138 is probably the greatest contributor of pollutants from developed uses in the Milton ACEC. Many of the residential properties within the ACEC are not sewered. Some of these are large old homes which may be served by cesspools. The Health Agent stated that the ACEC area did not have a generalized problem with failing septic systems; problems in the area are scattered and localized.

4.2.3 Future Development Concerns

As shown on Map 2: Underlying Zoning all of the land within the Milton ACEC is zoned for residential development. About 31 percent of the Milton ACEC is zoned

for one-acre lots and about 60 percent of the Milton ACEC is zoned for two-acre lots. Twenty-eight acres, which comprises most of the remaining area, is zoned for elderly housing. See Table 4-2 for a more detailed breakdown of zoning in the Milton ACEC.

There are some undeveloped and buildable residential lots within the ACEC, particularly along the Neponset Valley Parkway. Developable land within the ACEC includes the Fuller Trust property which will most likely be used for elderly housing (approximately 180 units). According to the Health Agent, this property would probably have to be sewered if it were developed for elderly housing. This would require an extension of the sewer line.

4.3 Municipal Land Use Regulations in Milton

4.3.1 Milton Zoning Bylaw

Use Regulations

There are five underlying zoning districts within the Milton portion of the ACEC, all of which are residential districts. Table 4-2 provides the number of acres, minimum lot area, and maximum lot coverage requirements for each of the five districts.

Table 4-2
Zoning Districts within the Milton ACEC

District	Map 2 Category	Acres in ACEC	Minimum Lot Area (sq. ft.)	Minimum Open Space Requirement*
Residence A	LDR	129.7	40,000	75% of bldg, pkg & driveway areas
Residence AA	LDR	248.5	80,000	100% of bldg, pkg & driveway areas
Residence B	MDR	3.8	20,000	50% of bldg, pkg & driveway areas
Residence C	HDR	4.0	7,500	--
Residence D2	HDR	27.8	30 acres**	No main bldgs w/in 175 ft, of public ways
Total Acres		**413.8**		

* The open space requirement is a percentage of the total of the combined area used for buildings, parking areas and driveways.
** This is a multi-family district for Elderly Housing.

Wetlands Regulations (Section IVB).

This section establishes a special permit requirement for certain work in wetland areas.

Flood Plain District (Section IVC).

The Flood Plain district is an overlay district that includes all special flood hazard areas designated as Flood Zone A or A1-30 on the Flood Insurance Rate Maps (FIRM). All development within the floodway must meet performance standards to ensure adequate flood proofing and to ensure that it does not increase flooding problems anywhere else in town.

Cluster Development (Sec. VIJ) and Open Space Development (VIM)

The cluster development provisions of the Milton zoning bylaw provide for flexible development plans that "permit development on large tracts of land in a manner which preserves open space and topography, wooded areas, and natural features of substantial portions of those tracts..." The purpose of the open space development provisions is "to preserve the residential character of the Town and to preserve open space in the Town."

Parking Regulations (Sec. VII)

Subsection H(1) of these regulations requires that runoff from parking areas "shall not adversely impact any wetland areas or adjoining property..."

Site Plan Approval (Sec. VIIID)

Site Plan approval regulations do not include environmental criteria related to water quality or preservation of significant natural features. The town's subdivision regulations include additional requirements for projects that require site plan approval (see Section 4.4.3, below).

Special Permit Review (Sec. IXC)

Special permit regulations do not include environmental criteria related to water quality or preservation of significant natural features or resources.

4.3.2 Milton Subdivision Regulations

Protection of Natural and Archaeological Features

The regulations include a general statement about the protection of natural features, as follows:

> The Board will require that the subdivider make every reasonable effort consistent with sound planning to preserve natural features such as large trees, water courses, scenic points, historic spots, and similar community assets, which, if preserved, will add attractiveness and value to the subdivision (sec. 6.4).

When there is reason to believe that archaeological artifacts may be in the area, the Planning Board may require the subdivider to allow monitoring of excavation and site work by a qualified person. If artifacts or other items of archaeological interest are discovered, the subdivider must immediately notify the Planning Board or the Town Engineer to obtain guidance and direction on how to proceed (sec. 7.3)

Flood Plain District (Sec. 3.8)

Proposals located within the Flood Plain zoning overlay district are reviewed to ensure that they minimize or eliminate potential flood damage to structures and utilities, and reduce exposure to flood hazards.

Statement of Development Effect (Sec. 5.4)

The Planning Board may require the submittal of a "Statement of Development Effect" which may include, among other things:

- a description of the general physical condition of the site, including amounts and varieties of vegetation, general topography, unusual geologic, scenic and historical features, trails and open space links, and indigenous wildlife;
- a description of temporary and permanent methods for control of erosion and sedimentation; and

- the estimated increase of peak run-off caused by altered surface conditions and methods to recharge water to the ground.

Storm Drainage (Sec. 8)

Storm drainage provisions do not address water quality except to require adequate control of erosion.

Site Plan Approval (Sec. 11)

The regulations require additional requirements for projects that are subject to both the Planning Board's subdivision regulations and the zoning bylaw's site plan approval regulations. Site plans for such projects must include:

- a written description of the site's current uses (such as watershed, wildlife habitat, woodland, or meadowland), the effects of the development on these uses, and the effort made to minimize these effects; and
- a statement of all significant impacts and measures proposed to address these impacts, including runoff and erosion control measures.

4.3.3 Milton Wetlands Bylaw and Regulations

Wetlands Bylaw

Additional wetlands interests protected by Milton's local wetlands bylaw include:

- erosion and sedimentation control;
- recreation; and
- aesthetics.

The bylaw allows the Commission to require a financial security, conservation restriction easement or other covenant to ensure that permit conditions are met.

Conservation Commission Rules & Regulations

The Conservation Commission regulations establish a "Zone of No-Disturbance" consisting of the area within 25 feet from the edge of any bank, land under water or bordering vegetated wetland. No alteration is permitted within this Zone of Non-

Disturbance, except for activities that are inherently water dependent (e.g., docks and marinas). A waiver can be granted only if the Commission votes that the proposed relief is consistent with the objectives of the Zone of No-Disturbance provision.

5.0 Norwood: Inventory and Assessment of Land Use and Regulations

5.1 Major Findings and Recommendations

The box below lists the major findings and recommendations relative to the portion of the ACEC within the Norwood municipal boundary.

Norwood: Major Findings and Recommendations

Major Findings

- All land in Norwood drains to the Fowl Meadow ACEC.
- Automile and other existing commercial and industrial development along Route 1.
- About half of Norwood ACEC zoned for industrial development, including wetlands and floodplains.
- Significant percentage of ACEC is located in Water Resource Protection District.
- Area of rare and endangered species habitat abutting Purgatory Brook zoned industrial and experiencing intense development pressure.
- Encroachment of development into wetland areas through past and current development.
- Stormwater runoff from I-95 and Route 128.
- Norwood airport.
- Pending regional projects.

Major Recommendations

- Rezone some industrially-zoned areas to less intensive use.
- Adopt ACEC bylaw or regulation with undisturbed buffer zone adjacent to wetlands.
- Strengthen enforcement of wetlands regulations.
- Begin using DEP Stormwater Management Standards for redevelopment and new development.
- Consider limits on impervious surface in Water Resource Protection District.
- Seek grant funding to remediate worst stormwater pollution problems.
- Encourage businesses to adopt programs to minimize stormwater pollution and improve waste handling practices.

5.2 Current and Potential Future Land Use in the Norwood ACEC

5.2.1 Brief Overview of Water Resources

Water Bodies in the ACEC

Neponset River; Plantingfield, Purgatory and Traphole Brooks.

Water Supplies

Norwood is entirely served by the MWRA water supply system and is approximately 98 to 99 percent served by the MWRA wastewater system. The Ellis Wellfield, located within the ACEC adjacent to Purgatory Brook and just east of Route 1, formerly supplied Norwood with water. The wellfield was closed in 1957 when Norwood began purchasing water from the MDC (now the MWRA). The town considered reactivating the wells in the 1970s but found extremely high levels of volatile organic compounds. Norwood does not intend to abandon the wells but has no intention of reactivating them at this time.

5.2.2 Current Land Use

Land Use Summary

1985 is the most recent year for which MacConnell land use data are available for Norwood. These data are shown numerically in Table 5-1 and graphically on Map 1. According to the 1985 data, of the 2,187 acres in the Norwood ACEC, 59 percent is undeveloped and 41 percent is developed.

Readers should note that there are several areas within the ACEC that have been developed subsequent to 1985. The newly developed areas include three areas now in commercial use, one in industrial use and one in residential use. The land use data in Table 5-1 and on Map 1 will therefore underestimate developed land uses and overestimate undeveloped land uses in the ACEC.

The ACEC within Norwood stretches along the entire eastern border of Norwood from the Neponset River west to Route 1, except for a small area (from Dean Street to just north of Nahatan Street) which does not extend all the way to Route 1. The entire land area of Norwood lies within the Neponset River Basin and stormwater runoff

from all developed parcels within the town flows toward the Neponset River and the ACEC.

Table 5-1
Norwood 1985 MacConnell Land Use in the ACEC

Land Use Category	Area (Acres)	Percent
Undeveloped Land Uses		
Agriculture	10.6	0.5%
Forest	570.7	26.1%
Wetland	647.4	29.6%
Open Land/Urban Land	51.5	2.4%
Water	2.6	0.1%
Total Undeveloped Land Uses	1282.8	58.7%
Developed Land Uses		
Residential: multi-family to 1/2 acre lots	339.7	15.5%
Residential: larger than 1/2 acre lots	9.8	0.4%
Commercial	22.5	1.0%
Industrial	113.7	5.2%
Transportation	266.7	12.2%
Recreation	151.4	6.9%
Total Developed Land Uses	903.8	41.3%
Total Land Use	2186.7	100.0%

Source: MacConnell land use data is developed by Resource Mapping, Department of Forestry, University of Massachusetts, Amherst and was provided by MassGIS.

There are a variety of developed land uses within the ACEC in Norwood, including residential, commercial, industrial, recreation (golf course) and transportation (Norwood airport, highway layouts). Most of the commercial and industrial

development within the ACEC lies along Route 1, including car dealerships that are part of the "Auto Mile" that stretches along both sides of Route 1 in Norwood. It is important to note that although the west side of Route 1 is not in the ACEC, land uses on the west side of the highway will affect the ACEC because drainage is toward the ACEC and Fowl Meadow.

There is a substantial amount of undevelopable wetland/floodplain in the Fowl Meadow bordering the Norwood Airport. Undevelopable land also includes town-owned water supply land around the Ellis wellfield and conservation land adjacent to Purgatory Brook, although the water supply land may be the future site of an electrical substation. Some of the undeveloped forested land within the ACEC may be converted to developed uses, as discussed below.

Current Issues and Concerns

The major impacts on the ACEC and the Neponset River from current development in Norwood are the "Auto Mile" and other commercial and industrial uses along Route 1, highway runoff from Route 95 and Route 1, and the Norwood airport. Automobile services are notorious "hot spots" for contamination of water quality. Furthermore, all of the drainage in the town of Norwood flows toward the Neponset River and the ACEC. Thus all land uses within the town have the potential to affect the Fowl Meadow ACEC.

Norwood airport is not a large source of de-icing chemicals, according to the Conservation Agent. The Airport does not de-ice whole planes, only an occasional windshield. Total annual consumption is less than five gallons per year. The airport has removed its underground storage tanks and replaced them with above ground tanks. The airport is making safety improvements which will include some encroachment into the Fowl Meadow wetlands. A helicopter has been used to remove trees to lessen the impact on the wetlands. A mitigation program for wetlands impacts is currently being discussed. The Conservation Commission reported that elevated levels of toluene and cadmium had been found in soils near the Norwood airport but that a source of contamination had not been discovered.

There are two golf courses in the ACEC, one of which abuts Purgatory Brook. Golf courses are a potential source of pesticides, fungicides and fertilizers. The town owns

conservation land adjacent to the golf course the abuts Purgatory Brook and has the right-of-first-refusal to purchase it should the owner ever wish to sell it. The other golf course, the Lost Brook Country Club, is part of the MediTech property on University Avenue. This golf course receives tax-relief protection under Chapter 61B.

Several individuals noted a need for the Norwood Conservation Commission to more stringently enforce wetlands regulations. Wetland resources in this area are dwindling and need to be preserved for the important functions they serve, including flood control, wildlife habitat and filtering contaminants from adjacent developed land uses. Route 1 is a highly developed area and the parking lots and buildings along Route 1 directly abut the wetlands.

Encroachments on wetland areas have occurred and continue to occur in the Route 1 area. A proposed retail project on Route 1 in Norwood (at the Morse Street extension) has received attention from the Neponset River Watershed Association, state agencies and the Army Corps of Engineers due to encroachment into wetland areas. According to a December 1996 letter from the Department of Environmental Management to the Executive Office of Environmental Affairs, the Army Corps of Engineers has delineated areas of illegal fill and has worked with the proponent's environmental consultant to remove accessible fill or reflag existing wetlands to reclaim approximately 4,000 square feet of wetlands.[3]

Norwood has recently hired a Conservation Agent and this should enable the town to improve its wetlands protection efforts. The town should seriously consider the adoption of an undisturbed buffer zone adjacent to wetlands to prevent further encroachments into wetland areas.

There is very little awareness of the Norwood ACEC among the public. This is probably due in large part to the fact that the ACEC is inaccessible wetland not suitable for hiking. The Norwood planner stated that he would be surprised if one in 100 Norwood citizens knew what an ACEC was, and he'd be even more surprised if they knew Norwood had one, even though it comprises four square miles in the town.

[3] Letter from Peter C. Webber, Commissioner, Department of Environmental Management to Trudy Coxe, Secretary, Executive Office of Environmental Affairs re: EOEA #10974, Proposed Retail Project (Spiegel), Norwood. December 30, 1996.

The brooks and river are used by NepRWA and some citizens but it is not a big constituency, although NepRWA and the Stream Team efforts are doing much to change this with the subwatershed groups.

5.2.3 Future Development Concerns

As shown on Map 2: Underlying Zoning and Table 5-2, 1,131 acres, or about half of the ACEC in Norwood, is zoned for industrial development. Map 1: 1985/1991 MacConnell Land Use shows that a substantial amount of the undeveloped and industrially-zoned land is wetland. The remainder of the Norwood ACEC is zoned for commercial uses (3 percent) and residential uses (45 percent), with minimum lot sizes of 15,000 square feet or less. Table 5-2, in Section 5.3, provides a detailed breakdown of zoning for the Norwood ACEC.

MAPC recommends that Norwood consider zoning amendments in the industrially-zoned areas of the Fowl Meadow to protect the critical resources of the ACEC. Large, contiguous areas that are unbuildable are good candidates for downzoning to a less intensive use. A general discussion of rezoning options is contained in Section 8.2.3.

According to the Norwood Planning Director, there is a limited amount of land available for future development within the Norwood ACEC, and most future activity within the ACEC will be redevelopment of existing uses.

The most significant future growth issue in the Norwood ACEC is the potential development of the 83-acre Walker property on University Avenue. The property, which is zoned for light manufacturing, is bounded by University Avenue on the north and Purgatory Brook on the south and contains recorded identifications of rare and endangered species habitat. Some of this land is undevelopable wetlands. The town's recent draft Open Space and Recreation Master Plan (discussed below in Section 5.3.1) recommends that the Walker property be purchased or that a conservation restriction be placed on the property.

The draft Open Space and Recreation Master Plan also recommends purchase of or a conservation restriction on the 210-acre Boston Municipal Airport (BMA) property.

This property, which hosts rare wildlife habitat, rings the airport and is not under control of the airport commission.

The draft Open Space and Recreation Master Plan also recommends that the Shalby property, which is located within the ACEC and adjacent to the Ellis wellfield, have a conservation restriction placed on it or be rezoned for general residential use. Outside of but directly across the street from the ACEC is the Boch property which includes more than 15 acres of wetlands. The draft Open Space and Recreation Master Plan recommends that a conservation restriction be placed on these wetlands.

Strict enforcement of state and local environmental regulations is critical to ensuring that future development protects ACEC resources. As discussed in the following section, Norwood's zoning bylaw and subdivision regulations contain strong environmental protection measures that can be used to require that development is sensitive to site-specific environmental resources. These regulations should be used to ensure that development plans include adequate buffers to protect rare and endangered species habitat and other critical resources.

5.3 Municipal Land Use Regulations in Norwood

5.3.1 Draft Open Space and Recreation Master Plan

Norwood has developed a draft Open Space and Recreation Master Plan that includes recommendations to protect and preserve Norwood's natural resources in general and the ACEC in particular. The draft Master Plan includes a Five-Year Action Plan that includes several action items that would have a positive future impact on the ACEC. The draft plan was distributed for review to town and state offices in March, 1997. Draft action items that would have a positive impact on the ACEC are as follows:

- Acquire conservation restriction or purchase the 83-acre parcel (Walker property) on University Avenue.
- Acquire conservation restriction or purchase 210-acre Boston Municipal Airport (BMA) parcel.
- Dredge silt in Mill Pond to preserve brown trout habitat and save the pond from eutrophication.

- Enact an ACEC overlay zone with the goal of improving stormwater runoff quality and reducing nonpoint source pollution.
- Acquire conservation restriction or rezone to general residential land abutting the Ellis Wellfield (the Shalby property).
- Seek a conservation restriction on approximately 15 acres of wetlands abutting the Ellis wellfield (the Boch property).
- Reduce road salt use near the Ellis wellfield.
- Amend the local wetland protection bylaw to add a 25-foot "no build" wetland buffer zone.
- Create a town-wide wetlands map.
- Increase enforcement of wetlands violations through use of "tickets" issued under the local non-criminal disposition bylaw (under authority of MGL chapter 21D).

5.3.2 Norwood Zoning Bylaw

Use Regulations

There are seven underlying zoning districts within the Norwood portion of the ACEC. Table 5-2 provides the number of acres, minimum lot area, and maximum lot coverage requirements for each of the seven districts.

Table 5-2
Zoning Districts within the Norwood ACEC

District	Map 2 Category	Acres in ACEC	Minimum Lot Area (sq. ft.)	Maximum Lot Coverage	Minimum Open Space
Single Residence S2	HDR	320.9	15,000	25%	25%
Single Residence S1	HDR	340.8	12,500	25%	25%
Single Residence	HDR	99.6	10,000	25%	25%
General Residence	HDR	224.4	10,000	35%	25%
Business	C	70.9	22,500	50%	25%
Manufacturing	I	723.0	10,000	70%	10%
Limited Manufacturing	I	407.6	130,680	50%	25%
Total Acres		**2187.2**			

Special Permit Review (Sec. 1400)

The criteria for granting special permits includes consideration of environmental impacts, including wetland loss, habitat disturbance, erosion, damage to valuable trees or other natural assets, and damage or risk to land or water resources because of planned processes or unplanned contingencies.

Development Plan Review (Sec. 1800)

Thresholds for review include:

- more than 3,000 square feet of gross floor area in a new building or, for additions to existing buildings, increases in the gross floor area by 10 percent or more;
- increases in parking facilities with ten or more spaces; and
- removal of existing vegetative ground cover from more than 20,000 square feet of site area.

Requirements include preparation of a site plan and proposed erosion control measures.

Environmental Protection Requirements (Sec. 5340)

This section of the zoning bylaw includes requirements for both stormwater management and erosion control.

The Inspector of Buildings, in consultation with the Department of Public Works and the Conservation Commission, is required to authorize or deny increases in pre-development peak runoff rates for proposals creating more than 10,000 sq. ft of impervious surface. Officials must consider downstream capacity, erosion, and siltation effects not prevented through on-site or off-site mitigation measures. The stormwater management subsection also requires that catch basins, detention basins and retention basins employ sediment basins, oil and gas traps, and other facilities as necessary, to maintain surface and groundwater quality.

The erosion control subsection requires the permanent stabilization of bare earth, authorizes the Building Inspector to require a performance bond to ensure completion of the work, and establishes performance standards for all construction. Erosion control plans are required for developments exposing more than 60,000 sq. ft of earth.

In areas having existing slopes in excess of 10 percent, highly erodible soils or other sensitive conditions, the threshold for requiring an erosion control plan is reduced to projects exposing 20,000 sq. ft. or more of earth.

Performance standards for erosion control include minimizing the disturbed area, maximizing retention of natural vegetation, installing sediment basins to remove sediment from runoff, and establishing time-frames for planting ground cover.

Flood Plain District (Sec. 6400)

The zoning bylaws establish a Flood Plain overlay district comprised of special flood hazard areas designated as Zone A, AI-30 on the Flood Insurance Rate Maps, and the Flood Boundary and Floodway Maps. All encroachments or development in the Floodway are prohibited unless it is demonstrated that such activity will not result in any increase in flood levels during the occurrence of the 100-year flood.

Water Resources Protection District (Sec. 6500)

The Water Resources Protection District is a zoning overlay district that protects the aquifer recharge area for the town's three wells (now inactive). These wells are located within the Fowl Meadow ACEC and the district includes a significant amount of land area within the Norwood portion of the ACEC. The bylaw prohibits or requires special permits for land uses with potential water quality impacts. The bylaw does not include additional requirements to minimize impervious surface and lot coverage. MAPC recommends that Norwood consider adding a limitation on impervious surface within the Water Resource Protection District.

Design and operation guidelines for construction in the district, other than single-family dwellings, include the following:

- runoff from all developed surfaces must be captured in a closed drainage system;
- groundwater recharge is required and where feasible must be over natural vegetated areas;
- drainage systems must employ oil, grease and sediment traps;

- fertilizers, pesticides and other leachable materials may not be stored outdoors nor used in amounts in excess of USEPA and Massachusetts Pesticide Board standards or USDA recommendations; and
- where fertilizers, pesticides or other potential contaminants are applied to areas greater than two acres, groundwater monitoring wells must be installed and periodically tested at the owner's expense.

Criteria for the issuance of special permits include the following:

- groundwater quality must not fall below federal or state drinking water standards, measured at the boundary of the site, or, if existing groundwater quality is already below those standards, the activity must not cause further deterioration; and
- proposed control and response measures must adequately and reliably mitigate risks to groundwater quality resulting from accidents or system failures.

Major Projects (section 6600)

The intent of the Major Project provisions is to "assure that large-scale developments are carefully tested against the Town's decision criteria relating locations and uses, and that adequate provisions are made for impacts of development." Major Projects require a special permit from the Planning Board. Site plans are required. Decision criteria are the same as for special permits issued under Section 1400 of the zoning bylaw.

Proposed ACEC Overlay District

Norwood's March 1997 Draft Open Space and Recreation Master Plan recommends that the town enact an ACEC overlay zone with the goal of improving stormwater runoff quality and reducing nonpoint source pollution. For example, compliance with the DEP Stormwater Management Standards would be required for all development within the ACEC overlay zone, rather than just within areas that discharge to wetlands. Norwood could also consider adding language to the zoning overlay bylaw that would ensure protection of rare wildlife habitat, wetlands and other critical resources.

5.3.3 Norwood Subdivision Regulations

Environmental Impact Statement

An environmental impact statement must be submitted with the definitive plan (sec. 4.3.2). The statement requires a thorough discussion of issues related to the natural environment, including land and water resources. In particular, the statement must:

- evaluate impacts on existing or potential public or private water supplies;
- describe and evaluate effectiveness of methods to control erosion and sedimentation during construction and post-construction;
- discuss probability of increases in pollution or turbidity within receiving waterway and precautions to be taken;
- describe the effect of proposed stormwater discharges on receiving waters;
- discuss the project's effect on waterway's aquatic biota and use as habitats;
- discuss the project's effects on groundwater quality and supply and efforts to recharge groundwater supplies;
- discuss the project's effects on the incidence of flooding, on and off-site;
- discuss the effect of proposed sewage disposal methods on surface and groundwater supplies and quality;
- discuss the project's effects on land-based ecosystems, including indigenous wildlife, stream bank cover and vegetal or wooded growth;
- describe proposed types and amounts of vegetal cover;
- discuss the existence of rare or endangered plant, wildlife or fish species in the project area; and
- discuss how the siting and construction of the project will affect existing and potential park and recreation areas, open spaces, natural areas, and scenic values.

In reviewing the Environmental Impact Statement, town boards must consider:

> "the degree to which water is recycled back into the ground, the maintenance and improvement of the flow and quality of surface waters; the preservation or promotion of wildlife refuges, historic sites, unique geological, botanical and archaeological features, existing or potential trails and accesses to open space areas; and the health and safety of the inhabitants of the area."

Other Requirements and Standards

Subdivision design standards require the protection of natural features, and specifically require that subdivision improvements:

> "adhere closely to the existing topography, preserve surfacial (sic) drainage patterns, preserve or improve aquifer recharge areas, preserve and enhance scenic spots and historic sites, preserve rock outcroppings and large or unusual trees and plants, avoid the creation of slopes prone to erosion, avoid encroachment upon watercourses and wetland areas, and preserve other such community and natural resources, the retention of which will add to the amenity and value of the subdivision" (sec. 5.4).

Culverts are only allowed to enclose waterways beneath streets. The regulations specify that "[N]o form of development will be permitted in the vicinity of a watercourse which would give impetus toward its future enclosure." (sec. 5.23.13)

Storm Drain System (sec. 5.23)

Artificial recharge of stormwater is required where feasible. A flood impact analysis is recommended for instances where surface runoff will be discharged in large quantities. No mention is made of effect on downstream water quality.

The Planning Board may require detention basins. Standards (sec. 5.23.16) include a requirement that post-development peak runoff rates be maintained at or below pre-development peak runoff rates at each drainage design outlet point on site.

Detention basin maintenance is the responsibility of the owner, until such time as the basin is accepted by the town as part of the street drainage system. The owner must establish an escrow account to guarantee the maintenance of the detention basin. The account must be retained for a period of one year from the date of the final release of the full subdivision performance guarantee or until the basin is accepted by the town, whichever is earlier (sec. 5.23.16.29).

5.3.4 Norwood Wetlands Bylaw

Norwood has adopted a local wetlands bylaw that protects the following additional wetlands values:

- erosion control;

- recreation; and
- aesthetics.

The Conservation Commission requires oil/gas separators, including an annual maintenance requirement, for projects requiring Conservation Commission permits. The Conservation Commission will require that stormwater be treated before discharge at all new commercial or industrial construction and when improvements are being made to existing commercial or industrial uses. The Conservation Commission reports that they sometimes issue Orders of Condition that restrict the amount of salt that can be applied to roads within the project area.

As mentioned under section 5.3.1, Norwood's March 1997 Draft Open Space and Recreation Master Plan makes several recommendations to stop wetland encroachment and degradation. The most important recommendation is to amend the local wetlands protection bylaw to add a 25-foot "no build" wetland buffer zone. MAPC strongly supports this proposal. "No-build" or "undisturbed" buffer zones are one of the most important tools that communities can use to prevent wetlands encroachment.

Other wetland-related recommendations in Norwood's draft plan include creating a town-wide wetlands map and using non-criminal disposition to enforce wetlands violations.

6.0 Sharon: Inventory and Assessment of Land Use and Regulations

6.1 Major Findings and Recommendations for the Sharon ACEC

The box below lists the major findings and recommendations relative to the portion of the ACEC within the Sharon municipal boundary.

Sharon: Major Findings and Recommendations

Major Findings

- All of the Sharon ACEC is zoned for low-density residential development.
- Stormwater runoff from I-95.
- Potential future water withdrawal.
- Pesticide/herbicide/fungicide use on golf courses and residential lawns.
- About half of ACEC is located in Groundwater Protection District.
- Zoning bylaw, wetlands bylaw/regulations and subdivision regulations contain strong erosion control and stormwater management measures.
- Zoning bylaw and wetlands bylaw/regulations include wetland setbacks with undisturbed buffer zone.

Major Recommendations

- Adopt ACEC bylaw or regulation.
- Adopt cluster zoning.
- Begin using DEP Stormwater Management Standards.
- See general recommendations in Chapter 8.

6.2 Current and Potential Future Land use in the Sharon ACEC

6.2.1 Brief Overview of Water Resources

Water Bodies within the ACEC

Neponset River; Traphole Brook; two unnamed streams.

Water Supplies in the ACEC

Sharon receives all of its water from local sources, with three wells in the Neponset Basin and four wells in the Taunton Basin. The existing Neponset Basin wells are not located within the Fowl Meadow ACEC, but the town is exploring a potential future well within the ACEC. Less than one percent of Sharon's population is connected to the town of Mansfield's sewage treatment plant; the remainder of the town utilizes on-site septic systems.

6.2.2 Current Land Use

Land Use Summary

MacConnell land use data from 1991 are available for Sharon. These data are shown numerically in Table 6-1 and graphically on Map 1. According to the 1991 data, of the 503 acres in the Sharon ACEC, 51 percent is undeveloped and 49 percent is developed.

The Sharon ACEC includes 503 acres in the northernmost section of town, extending from the boundary with Norwood, south to Edge Hill Road. Interstate 95 bisects the area, running from the southwestern to the northeastern end of the ACEC.

Current land uses within the Sharon portion of the ACEC are undeveloped forested land, recreation (two golf courses), wetlands, transportation (I-95), and low-density residential. The area to the north-northwest of I-95 is all forested land or wetlands, much of which is town-owned. All of this area is located within the town's Groundwater Protection District and the town is exploring the potential development of a new well in this area. According to the Town Engineer and the Conservation Agent, there are approximately 16½ acres of land in the ACEC that could be developed for residential uses.

Recreation is by far the most significant developed land use, comprising almost 40 percent of the land use in the Sharon ACEC. The Spring Valley Golf Course and the Meadow Brook Golf Course are both located almost entirely within the ACEC, with the latter course partially located in Sharon and partially located in Canton. A very small portion of the ACEC, located along Edge Hill Road at the southernmost end of the ACEC, is developed with low-density residential uses.

Table 6-1
Sharon 1991 MacConnell Land Use in the ACEC

Land Use Category	Area (Acres)	Percent
Undeveloped Land Uses		
Forest	225.5	44.8%
Wetland	30.6	6.1%
Water	1.0	0.2%
Total Undeveloped Land Uses	257.1	51.1%
Developed Land Uses		
Residential: larger than 1/2 acre lots	20.3	4.0%
Transportation	28.5	5.7%
Recreation	197.4	39.2%
Total Developed Land Uses	246.2	48.9%
Total Land Use	503.3	100.0%

Source: MacConnell land use data is developed by Resource Mapping, Department of Forestry, University of Massachusetts, Amherst and was provided by MassGIS.

Current Issues and Concerns

Impacts from current land uses in the ACEC include highway runoff from I-95, and runoff of pesticides and fertilizers from the two golf courses and residential lawns. The Town Engineer noted that I-95 has a very large layout and that there may be some room to install Best Management Practices to filter runoff from the highway.

6.2.3 Future Development Concerns

The two major issues with respect to future land uses in the ACEC are the potential development of a new water supply well and potential development on 16½ acres of land zoned low-density residential (60,000 square-foot lots). The primary issues with

regard to the potential well are possible wetland and stream impacts if the well receives a significant amount of its water from induced surface water infiltration. Access to the well may also have wetland impacts.

The most significant issue associated with future low-density residential development is likely to be herbicide and fertilizer use from lawn care.

6.3 Inventory of Municipal Land Use Regulations in Sharon

6.3.1 Sharon Zoning Bylaw

Use Regulations

There is only one underlying zoning district within the Sharon portion of the ACEC. Table 6-2 provides the number of acres, minimum lot area, and maximum lot coverage requirements for this residential district.

Table 6-2
Zoning Districts within the Sharon ACEC

District	Map 2 Category	Acres in ACEC	Minimum Lot Area (sq. ft.)	Maximum Lot Coverage	Minimum Natural Vegetation Area
Rural District, R-1	LDR	503.2	60,000	15%	40%

Parking Regulations (Sec. 3100)

Parking regulations do not include environmental performance criteria, but the zoning bylaw does allow for a reduction in the number of parking spaces constructed by allowing developments to share parking spaces.

Environmental Controls (Sec. 3300)

Wetlands Setback. Section 3320 of the Environmental Controls section establishes a wetlands setback regulation which applies to all land within 100 feet of: the normal high water mark of all ponds and lakes; the top of the banks of all streams; the land between the channels of braided streams; and the edge of bordering vegetated

wetlands. The bylaw severely limits the uses allowed within the 100-foot wetland setback.

Water Supply Setback. Section 3330 of the Environmental Controls Section establishes a water supply setback of 400 feet from any public well or well development area in the central portion of high yield aquifer deposits. The bylaw severely limits uses within the water supply setback area.

Sedimentation and Erosion. Section 3350 of the Environmental Controls Section requires a Comprehensive Sedimentation and Erosion Control Plan for the construction of structures, pavements, utilities and other site improvements that disturb more than 20,000 square feet of land cumulatively. This section also requires that the discharge of stormwater to any surface water body or water course, ditch, culvert or drainage system remove at least 80 percent of water-borne sediment.

Hazardous Materials. Section 3360 of the Environmental Controls Section prohibits the outdoor storage of toxic or hazardous materials except in product-tight containers which are protected from the elements, leakage, accidental damage and vandalism.

Flexible Development (Sec. 4300)

This provision provides for flexible development in residential districts, including the Rural Residential district in which the ACEC is located. One local official noted, however, that this provision is very difficult to use and has not operated as cluster zoning. Applicants must file an "Environmental and Community Assessment" as required under the town's Subdivision Regulations. Proposed open land that is not conveyed to the town must be covered by a recorded restriction that ensures that the land will be kept in an open state. A minimum of 80 percent of the open land must be maintained as a natural vegetation area.

Criteria for review of flexible development projects include the following:

- decrease environmental impacts through reduction in the length of streets per dwelling unit served;
- increase the scale of contiguous area assured of preservation in a natural state, off-street pathways and trails, and wilderness areas;

- preservation of environmental quality by a reduction of: vegetated areas disturbed by cut or fill or displacement; critical lands disturbed by construction; the extent of water ways altered or relocated; and the volume of cut and fill for roads and construction sites.

For the purposes of this regulation, "critical lands" are defined as lands with slopes in excess of 15 percent, land within 100 feet of a water body, wetland or stream, and land having outstanding or rare vegetation.

Flood Hazard District (Sec. 4400)

The Flood Hazard District is established as a zoning overlay district within the town. For all new residential construction or substantial improvements in the Flood Hazard District (akin to the 100-year flood boundary), the lowest floor must be elevated to or above the Base Flood Elevation. No encroachments are allowed within the Floodway unless it can be demonstrated that the proposed project will not result in any increase to the Base Flood Elevation during a flood.

Water Resource Protection District (Sec. 4500)

The Water Resource Protection District is a zoning overlay district that is further subdivided into two separate districts: the Groundwater Protection District and the Surface Water Resources Protection District. More than half of the land area within the ACEC is located within the town's Groundwater Protection District. Sharon has a proposed well site located within the Groundwater Protection District and the ACEC.

The bylaw prohibits or requires special permits for land uses with potential water quality impacts. The bylaw includes additional requirements to minimize impervious surface and lot coverage, however for the area within the ACEC, these requirements are the same as for the underlying zoning bylaw.

Standards for construction in the Water Resources Protection District include the following:

- no increase in the peak rate of stormwater runoff for the 10-year storm event and no increase in total volume of stormwater runoff for the 1-year storm event;

- runoff must be directed towards areas covered with vegetation for surface infiltration; and
- catch basins and piped storm sewers may be used only where other methods are infeasible, and when used must employ antipollution devices and stormwater retention/detention basins.

Criteria for issuance of special permits under the Water Resource Protection District include certification by a registered professional engineer that the proposed use will not have a significant adverse impact on water resources. The bylaw contains several other criteria that protect water resources, but these generally apply to uses other than low-density, single family residential uses, which are the only uses allowed within the ACEC.

Special Permits (Sec. 6310)

Criteria for review of special permit applications include the following:

- measures to minimize adverse impacts on public and private water supplies; and
- if within the Ground Water Resources Protection District, measures to minimize cumulative impacts on municipal water supplies, including consideration of nitrate-nitrogen loadings and other chemicals subject to drinking water regulations.

6.3.2 Sharon Subdivision Regulations

Environmental Assessment (Sec. 3.3.2.20)

A Comparative Environmental Assessment is required for any subdivision creating frontage potentially allowing 20 or more dwelling units or more than five acres of non-residential land. Requirements of the plan include a Comprehensive Sedimentation and Erosion Control Plan that shows control measures during construction and includes predevelopment and construction stage sediment loadings in all water courses.

Stormwater Management (Sec. 4.5)

Stormwater requirements include the following:

- Post-development peak discharge rates must not be greater than pre-development peak discharge rates for the two, ten and twenty-five year storm events.
- The total volume of the one-year storm event must be retained.
- All stormwater must pass through an oil/gas separator manhole prior to outfall.
- Prior to discharge, all stormwater must pass through a sedimentation basin capable of removing 80 percent of the water borne sediment.
- Stormwater must be conveyed to stormwater detention/retention basins capable of recharging the 10-year storm event.
- No increased down-gradient damage or erosion from stormwater caused by construction is permitted for the 100-year storm event.

Protection of Natural Features (Sec. 4.6.2)

Subdivision regulations specify that "[E]very effort shall be made in both design and construction to preserve and protect all natural features, such as trees, wooded areas, water courses, scenic points, historic spots, and similar community assets, which if preserved will add attractiveness and value to the subdivision."

Flood Hazard Avoidance (Sec. 4.8.6)

These regulations, which apply to subdivisions within the Flood Hazard District, require that subdivision design be "consistent with the need to minimize flood damage within the flood-prone area, through use of clustering, open space preservation, street profile design, and drainage."

6.3.3 Sharon Wetlands Bylaw and Regulations

Wetlands Bylaw

The Sharon wetlands bylaw regulates and controls activities deemed to have significant or cumulative effects upon the functions and characteristics of floodplains and wetlands. The bylaw and regulations protect additional interests and resource areas with standards and procedures stricter than those in state law and regulations.

Additional wetlands interests protected are:

- erosion and sedimentation control;
- protection of surrounding land and homes and buildings;
- protection of streams, ponds and other bodies of water;
- water quality enhancement;
- scenic vistas;
- recreation; and
- aesthetics.

Additional resource areas protected are:

- ditches (natural and/or man made);
- land subject to inundation by groundwater or surface water; and
- vernal pools (regardless of whether certified by the Mass. Division of Fisheries, Wildlife and Environmental Law Enforcement).

The first 25 feet of the buffer zone is presumed to be of primary concern and is regulated as though it were part of the resource area. The Conservation Commission may increase the buffer zone width in cases where the slope of the first 25 feet exceeds 18 percent, or "in any instance where the scope or nature of the project is likely to require a greater spatial offset to wetland resource areas..." (Regulations, sec. 5.02(6)). The bylaw does not allow activities, other than the maintenance of existing structures, within 25 feet of banks or freshwater/vegetated wetlands.

The Commission may require an applicant to place a conservation restriction or easement on intended unaltered resource areas to prevent future alteration to these resources (Regulations, sec. 2(18)).

Regulations include more stringent septic system setbacks from resource areas (sec. 2(24).

Sharon's wetlands regulations review the state ACEC regulations as they pertain to wetlands and state that it "should be assumed that variance requests from the Commission's Rules and Regulations, concerning proposals within the aforementioned ACEC's will be more difficult to obtain" (sec. 2(26)).

7.0 Westwood: Inventory and Assessment of Land Use and Regulations

7.1 Major Findings and Recommendations for the Westwood ACEC

The box below lists the major findings and recommendations relative to the portion of the ACEC within the Westwood municipal boundary.

Westwood: Major Findings and Recommendations

Major Findings

- About 60 percent of the ACEC is zoned for and developed with industrial uses (University Avenue area).
- Stormwater runoff into Neponset River from University Ave.
- Pending major development and redevelopment projects.
- All of the ACEC is included in a Water Resource Protection zoning overlay district which includes measures to maximize recharge and minimize stormwater pollution.
- Four water supply wells are located adjacent to industrial uses and are being treated for contamination.
- Loss of aquifer recharge through out-of-basin transfers to MWRA sewer.
- Pending regional projects (Route 128 station, rail electrification, etc.)

Major Recommendations

- Adopt ACEC bylaw or regulation with undisturbed buffer area adjacent to wetlands (could incorporate as subsection of Water Resource Protection District).
- Begin using DEP Stormwater Management Standards for redevelopment and new development.
- Minimize impervious surface (could do through Water Resource Prot'n District).
- Prevent loss of flood storage.
- Amend Environmental Impact and Design Review Standards to include water quality protection measures.
- See general recommendations in Chapter 8.

7.2 Current and Potential Future Land Use in the Westwood ACEC

7.2.1 Brief Overview of Water Resources

Water Bodies in the ACEC

Neponset River.

Water Supplies in the ACEC and Out-of-Basin Transfers

There are four water supply wells in the Westwood ACEC, operated by the Dedham-Westwood Water District. Approximately 78 percent of the Westwood population is sewered, so most of this water is not recharged to the aquifer. (See Dedham-Westwood in Section 3.2.1 for more information on these wells.)

7.2.2 Current Land Use

Land Use Summary

1985 is the most recent year for which MacConnell land use data are available for Westwood. These data are shown numerically in Table 7-1 and graphically on Map 1. According to the 1985 data, of the 169 acres in the Westwood ACEC, 40 percent is undeveloped and 60 percent is developed.

The Westwood ACEC consists of the 169-acre segment of land west of University Ave and extending to the Neponset River, which forms the municipal boundary with Canton. The Westwood ACEC is bisected by the MBTA/Amtrak railroad tracks. The ACEC area west of the tracks is developed in industrial uses and the area east of the tracks is all undeveloped, and undevelopable, floodplain. Existing uses west of the railroad tracks include warehouses, office space, two small retail operations and the Route 128 Amtrak/MBTA station and its associated parking facility. Four of the Dedham-Westwood Water District's wells are also located in this small stretch of land.

Current Issues and Concerns

The Dedham-Westwood Water District's wells are located adjacent to industrial uses, and are currently being treated to remove chemical contamination. The Massachusetts Department of Environmental Protection has identified these wells as

some of the most vulnerable in the state with respect to the threat of chemical contamination.

The Neponset River Watershed Association identified the University Avenue area as one of the areas about which they are most concerned due to the close proximity of public water supply wells, industrial uses, and hazardous waste sites, and the flushing of contaminated stormwater runoff into the adjacent Neponset River. Development of the University Avenue area entailed filling of wetland and floodplain areas. USGS topographic maps dating from the early 1940s show the gradual encroachment on the floodplain in the University Avenue Area in Westwood and Norwood.

Table 7-1
Westwood 1985 MacConnell Land Use in the ACEC

Land Use Category	Area (Acres)	Percent
Undeveloped Land Uses		
Forest	9.3	5.5%
Wetland	54.9	32.4%
Open Land/Urban Land	2.9	1.7%
Total Undeveloped Land Uses	67.1	39.7%
Developed Land Uses		
Residential: multi-family to 1/2 acre lots	3.5	2.1%
Residential: larger than 1/2 acre lots	2.0	1.2%
Industrial	86.6	51.2%
Transportation	9.9	5.8%
Total Developed Land Uses	102.0	60.3%
Total Land Use	169.1	100.0%

Source: MacConnell land use data is developed by Resource Mapping, Department of Forestry, University of Massachusetts, Amherst and was provided by MassGIS.

The Westwood Board of Health, the Westwood Conservation Commission and the Dedham-Westwood Water District are concerned about spraying of herbicides within the right-of-way for Conrail's freight spur tracks adjacent to University Avenue. Conrail has a no-spray zone within 400 feet of the wells. The Westwood Board of Health and the Water District have requested that the area outside the 400-foot area, but within the Zone II for the wells, be revised from a limited-spray zone to a no-spray zone. The Amtrak right-of-way within Westwood is all designated as a no-spray zone.

7.2.3 Future Development Concerns

Zoning for the Westwood ACEC is shown on Map 2: Underlying Zoning. Table 7-2 in section 7.3. provides a detailed breakdown of zoning for the Westwood ACEC.

Ninety-nine acres, or about 60 percent of the Westwood ACEC, is zoned for industrial development. Some commercial uses are allowed if they serve the industrial area. The remaining 40 percent of the Westwood ACEC is undeveloped wetland and floodplain zoned for residential development (one-acre lots). There is no access to this area, which is bordered on all sides by the railroad tracks, the Neponset River, floodplains and/or wetlands.

Due to environmental and access constraints, future development in the Westwood ACEC will be limited to the University Avenue area west of the railroad tracks. Future development will include building on vacant land as well as redeveloping existing properties. The town is encouraging growth in the University Avenue area and is making improvements to infrastructure in order to encourage such growth.

A major office building redevelopment project has been proposed for 505 Blue Hill Drive in Westwood. This is a 24.3 acre site located at the intersection of Blue Hill Drive and University Avenue, adjacent to the rail station. The site is within the ACEC, in close proximity to the Neponset River, and partly within the Zone I and entirely within the Zone II of the Dedham-Westwood Water District's White Lodge wellfield. According to the Environmental Notification Form (ENF) filed by the proponent, the project consists of expanding, or possibly replacing, an existing 268,000 square foot industrial warehouse/office building and creating a renovated or

entirely new 285,000 square foot office building. The number of parking spaces would be increased from 660 to 1,650 vehicles. Stormwater runoff is the most significant concern for this project. The proponent has committed to design the project in accordance with Best Management Practices and DEP Stormwater Management Standards and local water protection bylaws.

Another future project in the Westwood ACEC is the development of Westwood Corporate Center on vacant land off University Avenue. According to the June 1996 Environmental Impact Report for the Route 128 Improvement Project, the project includes construction of three office buildings and has permits but is not yet under construction.

Height restrictions in Westwood's zoning bylaw may result in a larger footprint for buildings in the University Avenue than would be allowed if the standards allowed taller structures. The Planning Board has submitted a zoning bylaw amendment that would allow buildings up to 65 feet in exchange for increases in vegetated area on a lot. The proposal will go before Town Meeting this spring. This proposal would benefit the watershed by reducing the footprint of new structures and thus reducing the adverse impacts that impervious surfaces and structures have on water quality and flood control.

The town of Westwood has applied for funding to reconstruct University Avenue and the streets adjacent to it. Reconstruction will include upgrading of the drainage to include oil/gas separators which will be maintained by the town on a regular schedule. The reconstruction is also intended to improve the accessibility and desirability of the area for future growth.

7.3 Inventory of Municipal Land Use Regulations in Westwood

7.3.1 Westwood Zoning Bylaw

Use Regulations

There are two underlying zoning districts within the Westwood portion of the ACEC. Ninety-nine acres are zoned for industrial uses and 70 acres are zoned for residential

uses. It is important to note that the area zoned for residential uses is virtually all undevelopable wetland and floodplain.

Table 7-2 provides the number of acres, minimum lot area, and maximum impervious surface requirements for the zoning districts in the Westwood ACEC.

Table 7-2
Zoning Districts within the Westwood ACEC

District	Map 2 Category	Acres in ACEC	Minimum Lot Area (sq. ft.)	Minimum NonWetland Area (sq ft.)	Maximum Impervious Surfaces*
Single Residence C	LDR	70.0	40,000	12,000	50%
Industrial	I	99.1	40,000	12,000	80%
Total		**169.1**			

* Note that all of the ACEC also falls within the Water Resource Protection District, which requires that at least 20% of the lot be maintained as a vegetated area.

Off-Street Parking (Sec. 11)

The Westwood zoning bylaw contains landscaping requirements to provide visual relief and wind interruption but not for pollution control. One of the conditions for obtaining a special permit to reduce the number of parking spaces required is the finding that fewer spaces would lessen the environmental impacts and enhance the aesthetic quality of the proposed project.

Flood Area Provisions (Sec. 12A)

The zoning bylaw establishes Special Flood Hazard Areas, which are the areas designated as Zones A and A1-30 on the Federal Flood Insurance Rate Maps. Permits for any uses may not be granted within this area unless it is demonstrated that the proposed use, when combined with all other uses and anticipated uses, will not increase the water surface elevation of the 100-year flood level more than one foot at any point. New construction or substantial improvements must be floodproofed as indicated in the bylaw.

Water Resource Protection District (Sec. 12B)

The Water Resource Protection District prohibits or requires special permits for uses that have potential impacts on groundwater quality. Design standards in the district include the following:

- Site design must not increase the peak rate of runoff in a 10-year storm and not increase the total volume of runoff in a one-year storm.
- Runoff must be directed toward areas covered with vegetation for surface infiltration. Catch basins and piped storm sewers may be used only where other methods are infeasible and must include water quality treatment measures.
- At least 20 percent of the lot area within the Water Resource Protection District must be vegetated and must be located to increase distances between impervious surfaces and on-site disposal systems and any surface water body or municipal well.
- If impervious surface covers more then 15 percent of the lot area within the Water Resource Protection District, all storm drainage must be recharged on site utilizing a system which will not degrade groundwater quality.

Flexible Plan Development (Sec. 14g)

This is a special permit provision that allows exceptions from lot configuration requirements for the "purpose of encouraging the preservation of open space and promoting the efficient use of land in harmony with its natural environment." Developments receiving special permits must preserve a specified minimum amount of open space, 80 percent of which must be retained in its natural state.

Environmental Impact and Design Review (Sec. 16A)

Projects required to comply with Section 16A review process include specified uses (e.g., gasoline and vehicular service stations), non-residential uses with 5 or more parking spaces, uses larger than specified thresholds, non-residential uses that front on certain major streets, and any expansion by three or more parking spaces of a parking area with five or more spaces.

In addition, any change in use which results in a use prohibited or requiring a special permit in a Water Resource Protection District, regardless of whether or not the use is

within the district or requires a building permit, is subject to review by the Zoning Enforcement Officer and, if the use involves hazardous materials above a specified threshold, shall be allowed only if the Planning Board determines that the applicant has documented that adequate safeguards for protecting the integrity of groundwater quality have been assured.

Design standards under this section include the following:

- Preservation of the landscape (minimizing tree and soil removal, due regard to natural features).
- Location and design shall not cause avoidable damage to wildlife habitats or corridors, or to any plant species listed as endangered, threatened, or of special concern by the Massachusetts Natural Heritage Program, or to any tree exceeding 24" one foot above grade. "Major Developments" must submit documentation to the Planning Board of having consulted with the Conservation Commission and the Massachusetts Natural Heritage Program regarding these considerations, and that the proposed site either contains no such habitats or materials, or that all feasible efforts to avoid, minimize, or compensate for damage have been reflected in the proposal.
- Location and design shall not cause avoidable damage or impairment to the historic or archaeological value of buildings or sites recorded on the Massachusetts Register of Historic Places.

The review provisions under Section 16A are very good, but could be improved somewhat with respect to protection of water quality. For example, there is no discussion of sedimentation and erosion control, or other measures to ensure that the site does not contribute to stormwater runoff pollution.

Major Developments (Sec. 16B)

This provision requires a special permit to ensure thorough review of large-scale business developments. Criteria for a Major Development permit includes the following:

- degree of assurance that no planned process or unplanned contingency will result in hazard or contamination of air, land or water resources; and
- degree of threat to environmental resources, including loss of valuable trees and other vegetation, disturbance to habitats, and soil loss through erosion.

7.3.2 Westwood Subdivision Regulations

Protection of Natural Features (Sec. IVE)

Subdivision regulations require that: "[A]ll natural features, such as large trees, water courses, scenic points, historic spots and similar community assets, which, if preserved, will add attractiveness and value to the subdivision, shall be preserved."

Surface Water (Sec. VIIIA)

Subdivision regulations state that: "[P]revision shall be made for the disposal of surface water so as to prevent pollution of swamps, marshes, ponds or other bodies of water, or water resources inside or outside the subdivision."

7.3.3 Westwood Wetlands Bylaw

The additional wetland values protected by the Westwood Wetlands Protection Bylaw (Article 18 of the General Bylaws) are erosion and sedimentation control and groundwater quality. The bylaw protects vernal ponds, an additional resource area not protected under the State Wetlands Protection Act.

Under section 8(k) of the Westwood Wetlands Protection Bylaw, any activity undertaken within ten feet of the boundary of a wetland, bank, pond, vernal pond, stream or river is presumed to alter that resource area. In practice, this provision works as a 10-foot building setback from the edge of the wetlands. The Conservation Commission has submitted a bylaw amendment to increase this presumption from 10 feet to 35 feet. This amendment will be voted on at the spring 1997 Town Meeting.

The Commission may engage technical consultants to review applications and information submitted under the bylaw and require the applicant to pay the costs for such consultants.

Permits must be recorded in the Registry of Deeds or with the Registry of the Land Court, and certification of recording is required prior to the commencement of work. To ensure that work is completed as required, the Commission may require posting of

a financial security or a conservation restriction, easement or other enforceable covenant whereby permit conditions must be met before the lot can be conveyed other than by mortgage deed.

8.0 General Recommendations

8.1 Regional Overview of Municipal Regulations

8.1.1 Goals and Tools for Municipal Regulation

In Massachusetts, planning and regulation of land use and development activities falls primarily to local government under the long-standing tradition of "Home Rule." Regulation of development is conducted by local boards under the overall guidelines of state enabling legislation such as the Zoning Act, the Subdivision Control Act, the Wetlands Protection Act and Title 5. Responsibility to apply these statutes in each community falls to local boards such as the Planning Board, the Board of Appeals, the Conservation Commission, and the Board of Health. The authorities under which these boards operate are summarized in Table 8-1.

Local communities can use their "Home Rule" authority to adopt regulations which supplement state requirements either by strengthening the minimum requirements of state statutes, or by adopting new bylaws or regulations to address such issues as stormwater pollution, underground storage tanks, or hazardous materials. Chapters 2 through 7 inventory municipal regulations in the six study communities that have the potential to affect the environmental quality of the ACEC.

In understanding local regulations it is important to remember that zoning bylaws and subdivision regulations address new development only. Local zoning bylaws must be adopted by a two-thirds majority of town meeting. Subdivision regulations are passed by the Planning Board and wetlands regulations by the Conservation Commission. General bylaws (such as wetlands bylaws, hazardous materials bylaws and erosion control bylaws) are adopted by a simple majority at Town Meeting.

Because many of the recommendations and tools are not focused on the ACEC alone, adoption of the measures recommended in this plan can help protect all of the water resources in the town, not just water resources in the ACEC. Readers should remember that the ACEC does not exist in isolation and that impacts within the watershed but upstream of the ACEC can have an impact on the ACEC. It is important to maintain a focus on the broad goals of watershed protection.

Table 8-1
Summary of Local Authority to Regulate Development

Local Board	State Statute	Areas of Responsibility
Planning Board	Zoning Act	Enforcement of Local Zoning Bylaw Site Plan Review
	Subdivision Control Act	Review and Approval of Subdivisions
Board of Appeals	Zoning Act	Granting Special Permits, Appeals and Variances
Conservation Commission	Wetlands Protection Act	Enforcement of State Wetlands Protection Act and DEP Stormwater Management Standards Enforcement of local wetlands protection bylaw and regulations (if any)
	Rivers Protection Act	Enforcement of Rivers Protection Act
Board of Health	Title 5 of State Environmental Code	Regulating on-site wastewater disposal
	Subdivision Control Act	Review of Subdivisions

There are many measures that local communities can take to further the protection of the ACEC. Table 8-2 summarizes the major goals of local ACEC protection, the issues of concern regarding each, and the tools that can be used to implement these goals.

8.1.2 Cross-Comparison of Municipal Regulations

Table 8-3 is a matrix that notes which provisions in each town's regulations and bylaws help to meet the goals of ACEC protection. The first section of the matrix is organized by goals (e.g., wetlands protection, aquifer protection) and the second section of the matrix is organized by tools (predominantly tools to be used through zoning). To minimize redundancy, measures that are covered under the "Goals" section of the matrix are not also covered under the "Tools" section of the matrix (e.g., wetlands bylaws are covered under the heading for wetlands protection goals and are not also listed as a separate tool).

Table 8-2
Local ACEC Protection Measures: Goals, Issues and Tools

Goals	Issues of Concern	Tools
Minimize Stormwater Runoff Pollution	Pollutants such as sediments, hydrocarbons, heavy metals, bacteria and nutrients run off impervious surfaces during storm events and pollute groundwater and surface water, with the potential to pollute public drinking water supplies.	- DEP Stormwater Management Standards and Best Management Practices. - Stormwater performance standards in zoning bylaw, wetlands bylaw/regs, subdivision regs. - Stormwater regulations adopted by Planning Board, Conservation Commission and/or Board of Health. - Catch basin cleaning and street sweeping. - Grant programs (e.g., sec. 319) for remediation.
Minimize Erosion/ Sedimentation	Primarily construction related in this area. Excavated soil washed into waterways adversely affects aquatic habitat, vegetation and animal life.	- Provisions in zoning bylaw, subdivision regulations, wetlands bylaw. - Erosion/sedimentation bylaw.
Minimize Impervious Surfaces	Increased imperviousness is linked to degradation of waterways and loss of aquatic species and loss of aquifer recharge.	- ACEC regulation. - Performance standards in zoning bylaw, subdivision regulations and wetlands bylaw/regulations. - Cluster zoning and flexible site plans.
Maximize On-site Recharge	Water withdrawn from water supply wells is transferred out of basin through sewer system, thus depleting the aquifer.	- Aquifer protection zoning overlay district. - Zoning bylaw and subdivision regulations. - DEP Stormwater Management Standards.
Maximize Wetlands and River Protection	Incremental losses of wetlands accrue to cause serious loss of flood storage and wildlife habitat and diminishment in water quality.	- ACEC regulation with increased wetland setbacks and undisturbed buffer zone. - Wetlands bylaw and regulations, including undisturbed buffer zone. - Rivers Protection Act.
Protect Aquifers	Existing and proposed public water supplies for four communities depend on the Fowl Meadow aquifer, which is at risk from pollution and depletion.	- Aquifer protection zoning overlay district. - Inter-community coordination and cooperation to protect recharge areas that cross municipal boundaries.
Prevent and minimize flood damage	Encroachment of development into the floodplain creates loss of flood storage capacity and increases frequency and severity of flooding.	- Zoning overlay district for 100-year floodplain. - Provisions in subdivision regulations

Table 8-2 (cont.)
Local ACEC Protection Measures: Goals, Issues and Tools

Goals	Issues of Concern	Tools
Protect rare or endangered species habitat	Development encroaching into rare or endangered species habitat further threatens these species.	- ACEC regulation that requires identification and protection of rare or endangered species habitat. - Development regulations (zoning, subdivision, wetlands bylaws/regulations) that require protection of such habitat.
Protect historic and archaeological resources	Destruction or diminishment of sites or structures of historic or archaeological significance.	- ACEC regulation that requires identification and protection of sites or structures of historic or archaeological significance. - Development regulations that require protection of sites or structures of historic or archaeological significance.

MAPC encourages the communities to review Table 8-3 to understand the types of tools they and other communities are using and to help identify areas for improvement. For example, community reviewers may find that their community has little in the way of regulatory measures to minimize erosion and sedimentation. They can use Table 8-3 to identify other communities in the ACEC that have such measures, review a summary of these measures in the appropriate section of this report and then consider whether any of these measures could be tailored for their communities' use.

8.2 General Recommendations to all Towns in the ACEC

8.2.1 ACEC Bylaw/Regulation

Most of the municipal regulations that were reviewed in Chapters 2 through 7, and most of the tools described in Tables 8-2 and 8-3 address protection of environmental resources throughout a community, and are not specific to protection of the ACEC. MAPC recommends that the six communities consider adopting an ACEC-specific bylaw or regulation.

An ACEC bylaw or regulation — which pertains only to projects constructed within the ACEC, or within a certain distance of the ACEC — can provide improved protection to critical ACEC resources, including wetlands, wildlife habitat, water supplies, floodplains, and archaeological and historic resources. An ACEC bylaw or regulation can be adopted through a town's zoning bylaw and wetlands bylaw or regulations. If desired, a town can adopt a zoning overlay district for the ACEC. Norwood's draft Open Space and Recreation Master Plan recommends this approach.

For lots that are located only partially within the ACEC, an ACEC bylaw or regulation can require that development be moved away from the ACEC portion of the lot. For lots that are located entirely within the ACEC, an ACEC bylaw or regulation can establish an undisturbed buffer zone that prohibits building or impervious surfaces within a certain distance of wetland resources. Communities can also use an ACEC bylaw or regulation to require certain long-term activities, such as monitoring, maintenance, and use of minimal amounts of salt, fertilizers and pesticides.

Table 8-3
Checklist of Local Bylaws and Regulations

GOAL	**Canton**	**Dedham**	**Milton**	**Norwood**	**Sharon**	**Westwood**
Minimize Stormwater Pollution	-Groundwater Protection District (Z) - Wetlands Bylaw	-Wetlands Bylaw & Regulations -Aquifer Protection District (Z)		-Env'l Require-ments (Z) - Subdivision Regs. -Water Resources Prot'n District (Z)	-Subdivision Regs - Environmental Controls (Z) -Water Resource Prot'n District (Z)	-Water Resource Prot'n District (Z) -Major Developments (Z) -Subdivision Regs
Minimize Erosion/ Sedimentation	-Wetlands Bylaw & Regulations	- Wetlands Bylaw & Regulations	- Wetlands Bylaw & Regulations - Subdivision Regulations	- Development Plan Review, Special Permits (Z) - Env'l Req'mts (Z) - Subdivision Regs - Wetlands Bylaw	-Environmental Controls (Z) -Flexible Dev't (Z) -Subdivision Regs	-Major Developments (Z)
Maximize Wetlands and River Protection	- Wetlands Bylaw & Regulations -Wetlands buffer zone (WB)	- Wetlands Bylaw & Regulations - Wetlands buffer zone (WB)	-Wetlands Bylaw and Regs. including buffer zone (WB) -Special permit requirement (Z) -Parking reg'n (Z)	-Wetlands Bylaw -Special Permit review (Z)	-Wetlands Bylaw & Regulations -Wetlands Setback (Z) -Wetlands buffer zone (WB)	-Wetlands Bylaw - Projects within 10 ft. of wetlands presumed to alter resource area
Minimize Impervious Surface	- Groundwater Protection District (Z)	-Aquifer Protection District (Z)	- Cluster Development		-Flexible Dev't (Z) -Water Resource Prot'n District (Z)	-Water Resource Protection District (Z) (but could be stronger)
Maximize On-site Recharge	- Groundwater Protection District (Z)	-Wetlands Regulations -Aquifer Protection District (Z)	-Subdivision Regulations	- Subdivision Regs -Water Resources Prot'n District (Z)	-Water Resource Prot'n District (Z) -Subdivision Regs	-Water Resource Prot'n District (Z)

Legend

GB = General Bylaw
WB = Wetlands Bylaw and Regulations
S = Subdivision Regulations
Z = Zoning Bylaw

Table 8-3
Checklist of Local Bylaws and Regulations (cont.)

GOAL	**Canton**	**Dedham**	**Milton**	**Norwood**	**Sharon**	**Westwood**
Protect Aquifers*	- Groundwater Protection District (Z)	-Aquifer Protection District (Z)	[No significant aquifer area in Milton]	Water Resources Prot'n District (Z) (needs limits on impervious surface)	-Groundwater Prot'n District (Z) -Water Supply Setback (Z)	-Water Resource Protection District (Z)
Prevent and Minimize Flood Damage	-Flood Plain District and Federal Flood Plain District (Z)	-Flood Plain District (Z)	-Flood Plain District (Z) -Subdivision Regs	-Flood Plain District (Z)	-Flood Hazard District (Z) -Subdivision Regs	-Special Flood Hazard Area (Z)
Preserve Historic/Arch-aelogical Sites	-Wetlands Bylaw		-Subdivision Regs	-Subdivision Regs	-Flexible Dev't (Z) -Subdivision Regs	-Env'l Impact & Design Review (Z) -Subdivision Regs
TOOLS	**Canton**	**Dedham**	**Milton**	**Norwood**	**Sharon**	**Westwood**
Site Plan Review		-Major site plan review (Z) includes env'l impact assessment	-Subdivision Regs include env'l criteria for projects requiring site plan approval only	-Development Plan Review (Z) requires erosion control measures	-Underlying uses in ACEC (low-density residential) do not require site plan review	-Environmental Impact & Design Review (Z)
Special Permit Review				Special Permit Review (Z) includes environmental criteria	Special Permit Review (Z) Includes environmental criteria	

*NOTE: Local aquifer protection bylaws do not usually include protection for neighboring communities' water supplies (e.g., the Dedham-Westwood Water District's Fowl Meadow well is located in Dedham, but the recharge area extends into Canton, Westwood and Norwood).

Table 8-3
Checklist of Local Bylaws and Regulations (cont.)

TOOLS	Canton	Dedham	Milton	Norwood	Sharon	Westwood
Cluster Development			-Cluster Development (Z) -Open Space Development (Z)		-Flexible Development (Z)	-Flexible Plan Development (Z)
Planned Unit Development/ Major Projects		-Planned Residential and Commercial Development (Z)		-Major Projects (Z) -Master Development Plan (Z)		-Major Developments (Z)
Parking Regulations		-Contaminated runoff may not be discharged directly to wetland or water body (Z)	-Runoff from pkg area may not adversely impact any wetland areas (Z)			
Hazardous Materials	- Hazardous Mat'l and Underground Storage Tank Bylaws (GB) - Groundwater Protection District (Z)	-Aquifer Protection District (Z)		-Water Resources Prot'n District (Z)	-Underground Storage Tank Bylaw (GB) -Discharge/Storage Prohibitions (Z) -Water Resource Prot'n District (Z)	-Hazardous Materials Bylaw (GB) -Water Resource Protection District (Z)
Pet Waste Removal		-Dog Control Law, Chapter XXIII (GB)		-General Bylaw (Article XII)		-General Bylaw (Art. 15), limited to public parks, playgrounds, school property

Several communities in Massachusetts, including Bourne, Easton, Falmouth, Gloucester, Ipswich and Mashpee have adopted ACEC-specific provisions in their wetlands regulations and/or zoning bylaws. These provisions are summarized in Table 8-4 and paragraphs below.

Table 8-4
Examples of Local ACEC Regulations

Town	*General Bylaw*	*Wetlands Bylaw/Regs.*	*Zoning Bylaw*	*Notes*
Bourne	X			Conservation Commission can prohibit building in ACEC.
Easton		X		Variance required for all projects in the ACEC.
Gloucester		X		Conservation Commission jurisdiction increased to 300 ft. in ACEC.
Falmouth		X	X	No primary structures, clear cutting of vegetation, or alteration of habitat w/in 50 ft. of an ACEC (w/in 100 ft. of wetlands for lots totally w/in the ACEC).
Ipswich		X		Land w/in 150 ft. of ACEC defined as a wetland resource area.
Mashpee			X	No structures or clear cutting of vegetation w/in 25 ft. of an ACEC (w/in 100 ft. of wetlands for lots totally w/in the ACEC).

Bourne: Bourne's General Bylaws (Section 3.7.5) authorize the Conservation Commission to prohibit the location of any building or structure within an area designated as an ACEC.

Easton: The Easton Conservation Commission has adopted regulations that provide additional protection to the town's two ACEC's, which together comprise almost 50 percent of the land area in the town. The regulations, included in Appendix B, require a variance request for any project in the ACEC that lies within a wetland resource area or the 100-foot buffer zone. Variance requests receive close scrutiny from the Conservation Commission.

Gloucester: Gloucester has adopted an ACEC regulation through their local wetlands ordinance. The ordinance expands the Conservation Commission's jurisdiction to within 300 feet horizontally outward from the ACEC (a 100-foot Resource Area known as the "Upland Edge" and another 200-foot buffer zone).

Falmouth: Falmouth has adopted ACEC regulations through its local wetlands bylaw and through its zoning bylaw for protection of the Waquoit Bay ACEC.

Article XIX of the Falmouth zoning bylaw (Areas of Critical Environmental Concern) prohibits the construction of structures other than accessory buildings and prohibits the clear cutting of existing vegetation or the alteration of wildlife habitats (except to provide access to permitted structures), within a buffer zone extending 50 feet from the edge of the ACEC. For lots or parcels totally encompassed by the ACEC, Article XIX applies to the 100-foot buffer zone from the edge of the wetlands.

Falmouth's zoning bylaws require that certain activities affecting wetlands and certain activities within the local Floodplain District obtain a special permit from the Board of Selectmen. Special permits are not issued in the ACEC "unless all available means of mitigating or reducing environmental damage have been implemented and any remaining environmental damage is minor or insignificant enough to not irreparably affect the ACEC or its resources" (Article XVII - Wetlands Regulations, section 240-79; and Article XVIII - Floodplain District, section 240-85).

The ACEC regulations in Falmouth's Wetland Protection Bylaws state that a "higher performance standard, that of 'no adverse effect,' must be met for activities in this special area....A buffer strip, sited inland and immediately adjacent to the ACEC, is essential." The regulations discuss the importance and function of the critical resources within the ACEC and state that "[M]inimum alteration of the natural features of the ACEC will allow them to function at their natural capacity."

Ipswich

Ipswich's Wetlands Protection By-law expands the definition of a wetland resource areas to include the land within 150 feet of the ACEC. Any permitted work within the ACEC must show that all potential impacts have been mitigated. The applicant must include erosion control measures and other mitigation measures to document how potential impacts will be minimized.

Mashpee

Article XIV of Mashpee's zoning bylaw provides additional protection to the Waquoit Bay ACEC. These regulations are attached as Appendix B. The Article applies to land within the ACEC as well as a 25-foot buffer zone. For lots or land parcels totally encompassed by the ACEC, the Article applies to 100-foot wetlands buffer zone. Within that zone, most construction of dwellings or any other primary or accessory buildings or structures is prohibited. Also there is no clear cutting of vegetation with the exception of a path of no more than 20 feet providing access to permitted structures of passive recreation.

There is no dumping, filling, paving, removal of materials or dredging without a special permit. Any pre-existing non-conforming structures may be altered provided that the improvement does not extend more than ten feet closer to any open water or wetland.

8.2.2 Zoning, Site Planning and Subdivision Regulations

Zoning bylaws (including site plan provisions) and subdivision regulations are the primary tools through which communities control the nature and impact of development.

Zoning bylaws establish the uses allowed within each zoning district, and control the density of development, the amount of impervious surface allowed on a lot, and the percentage of a lot that must be maintained in landscaping or natural vegetation. Zoning can be used to limit development in sensitive areas such as steep slopes and can include provisions to regulate impacts such as sedimentation and erosion, and water quality impacts from parking lots. Zoning bylaws contain can encourage site design that is protective of environmental resources through criteria for site plans and major developments and provisions for flexible or cluster developments.

Zoning overlay district bylaws protect specific resources such as aquifers or floodplains. An overlay zone can be adopted for the ACEC and is one of the recommended ways in which a town can adopt stricter regulations that apply only to the ACEC (see Section 8.2.1). Zoning overlay districts add additional development regulations that apply only to a specific resource (e.g., the ACEC).

The following list provides some general recommendations relative to site planning and development for all of the communities.

- Communities should review Table 8-3, the checklist of local bylaws and regulations to determine whether zoning bylaws and subdivision regulations include measures that will help protect the ACEC.
- Most of the communities could do more to prevent stormwater pollution from new developments and ensure that water quality improvements are included when a site is redeveloped. This can include requirements for Best Management Practices, controls on erosion and sedimentation, limitations on impervious surfaces, and lot coverage. Conservation Commissions can begin adopting the new Stormwater Management Standards issued by the DEP.
- Most of the communities could do more to ensure that site plans for major developments and subdivisions can be flexible enough to protect resources, by using cluster zoning and flexible site plans. In addition, revisions to building height limits could be revised where appropriate (i.e., where aesthetics and vista views would not be impaired).
- None of the communities are using "transfer of development rights" which is a zoning tool that could be used to guide development away from the ACEC and toward areas where the community would like to encourage development.
- Parking regulations in most communities could be revised to include standards for water quality protection.
- Communities should adopt an undisturbed buffer zone adjacent to wetlands and also consider expanding the 100-foot wetland buffer zone. (See additional discussion in sections 8.2.1 and 8.2.4.)

Proper site planning can help ensure that developments achieve environmental protection and stormwater management goals. Site planning that integrates comprehensive stormwater management into the site development process from the outset is the most effective approach to reduce and prevent potential pollution and flooding problems. Early stormwater management planning will generally minimize the size and cost of structural solutions.

The DEP/MCZM Draft Performance Standards and Guidelines for Stormwater Management in Massachusetts (April 1996) cite the following goals for site planning

in relation to prevention of stormwater pollution. These goals can be incorporated into site plan review and subdivision regulations:

- Avoid construction and development in sensitive areas (e.g., buffer zones, natural drainageways, steep slopes and porous and erodible soils).
- Reduce and minimize impervious surfaces.
- Include specific Best Management Practices (BMP) requirements.
- Reproduce pre-development hydrological conditions.
- Fit the development to the terrain.
- Preserve and utilize natural drainage systems.

Existing subdivision regulations in the communities can exacerbate stormwater runoff problems. Excessively large street widths and requirements for curb and gutter streets can create significant stormwater management problems. Subdivision regulations should aim for flexibility while ensuring safety. Subdivision regulations can require projects to minimize cut and fill, the dimension of paved areas and the area over which vegetation is disturbed.

The DEP/MCZM Draft Performance Standards and Guidelines for Stormwater Management in Massachusetts (April 1996) and other documents currently available in the literature provide guidance for drafting site plan and subdivision regulations that minimize stormwater and other environmental impacts.

8.2.3 Rezoning

All of the land within the ACEC is zoned for industrial, residential or commercial development despite the fact that the land may be in public ownership for preservation purposes or may be unbuildable wetland or floodplain. Over one-third of the ACEC is zoned industrial.

MAPC recommends that the communities look more closely at lands located within the ACEC and determine whether rezoning is an appropriate tool. The communities (i.e., Planning Boards, Master Plan Committees, Conservation Commissions, Open Space Committees, etc.) should ask the following questions about land within the ACEC:

- Does the area sustain important environmental resources (e.g., wetlands, floodplain, endangered species habitat)? What level of protection do these resources require?
- Is current zoning consistent with environmental protection needs?
- Is the zoned use the land use that the community desires?
- Is the zoned use consistent with the town's Master Plan and Open Space Plan?
- Is the area zoned for development but essentially unbuildable?
- Is the area zoned for development but owned for preservation?
- Is the zoned use consistent with abutting land uses and zoning?
- Is the area under pressure to be developed?

If, after working through the above questions, the community finds that the land is not zoned appropriately, options to consider include changing the underlying zoning to a use primarily intended for conservation and open space (e.g., downzoning from industrial to "conservation/open space"), or changing the underlying zoning to a use that allows less intensive development (e.g., downzoning from industrial to low-density residential).

Conservation/open space zoning can be considered for large, contiguous areas in which land uses should be severely limited. Examples include: areas owned by the MDC or other public or private institutions for preservation purposes; large, contiguous areas of wetland and/or floodplain; and areas that the community wants to keep preserved as open space with very limited development (consistent with its Master Plan and Open Space Plan). Remember that rezoning that is consistent with a Master Plan is more likely to withstand a court challenge.

Rezoning to a less-intensive use (e.g., from industrial to low-density residential or from high- to low-density residential) may be appropriate when the community desires less intensive development than zoning allows in a given area, and the area can withstand the proposed level of development. If this approach is used, it is important to ensure that the level of development that the new zoning allows is sustainable, and to adopt regulations (such as an ACEC bylaw or regulation, an undisturbed wetlands buffer zone, or a river setback) that would ensure that any development would not encroach on the sensitive resources of the ACEC. ACEC bylaws/regulations are discussed in section 8.2.1.

A conservation/open space district has as its primary purpose conservation of natural resources, passive recreation and environmental education. Several towns in the MAPC region, including Winchester, Stoneham, Dover and Stow, have adopted conservation/open space zones.

Winchester has adopted a Conservancy-Institutional District which is intended primarily for "conservational, educational, institutional and recreational uses." Land within the MDC-owned Middlesex Fells Reservation is zoned Conservancy-Institutional. Uses allowed by right within the Conservancy-Institutional District include recreational uses, educational institutions, conservation, agriculture, horticulture or floriculture, cemeteries, television antennae, and veterinary establishments. Uses allowed with a special permit in the Conservancy-Institutional District include private lodges or clubs, philanthropic or charitable institutions, and nursing homes. See Appendix C for a description of Winchester's Conservancy-Institutional District.

The town of Stoneham has adopted a Recreation/Open Space District similar to Winchester's, for the purpose of providing "areas of low intensity public and semipublic uses which serve to protect and preserve the water supply, groundwater quality and natural features and/or features which serve a regional purpose." The Recreation/Open Space District includes land within MDC's Middlesex Fells Reservation. Appendix C includes a description of the zoning and the uses allowed, which are similar to those allowed in Winchester's Conservancy-Institutional District.

The town of Dover has both a Conservancy and an Open Space/Official district. Uses allowed as of right in the Conservancy District include farms and gardens and municipal recreation. Uses allowed by special permit in the Conservancy District include commercial kennels, commercial stables, airports or landing fields, and windmills. The Open Space/Official District is similar to the Conservancy District, except that kennels and stables are not permitted, educational and municipal uses are allowed by right, and cemeteries, hospitals, sanitariums, and non-profit institutions or philanthropic uses are allowed with a special permit.

8.2.4 Wetlands Protection

Because the ACEC includes a vast amount of significant wetland and floodplain resources, wetlands protection is one of the most important means of preserving the environmental quality of the ACEC. Communities can protect the ACEC through the stringent enforcement of state wetland regulations (310 CMR 10.00) and the adoption and enforcement of strong local wetlands bylaws and regulations.

Conservation Commissions should keep in mind that the Wetlands Protection Regulations prohibit the destruction or impairment of a "Bordering Vegetated Wetland" (BVW) within an ACEC unless the proposed project qualifies as a "limited project" listed at 310 CMR 10.53(3). Also, a request for an appeal to the Department of Environmental Protection (i.e., a superseding Order of Conditions) or a local Order of Conditions requires a review under the MEPA regulations (see section 1.1).

As important as these provisions are, however, they do not provide for the crucial level of protection that can be provided through local wetland bylaws. Local wetlands bylaws and regulations for the six study communities are reviewed in chapters 2 through 7. Several of the ACEC communities have adopted excellent local wetlands protection bylaws and regulations, particularly Canton, Dedham and Sharon. Dedham's Conservation Commission regulations (attached as Appendix A) contain excellent water quality protection measures, including the essential elements of the DEP's new Stormwater Management Standards.

MAPC recommends that communities protect the state-mandated 100-foot wetlands buffer zone from development to the greatest extent possible. Communities should give serious thought to expanding the buffer zone in the ACEC, if not town-wide, and including language that prohibits buildings or impervious surfaces (i.e., undisturbed buffer zones or "no-build" zones) in at least part of the buffer zone. Larger setbacks or undisturbed buffer zones can be adopted town-wide or in the ACEC only. ACEC-specific provisions can be adopted through wetlands bylaws or regulations or through an ACEC bylaw or regulation as discussed in Section 8.2.1. Canton, Dedham, Sharon and Milton have all adopted undisturbed buffer zones and Westwood regulates the 10-foot zone adjacent to wetlands as part of the resource area. MAPC recommends that Norwood adopt an undisturbed buffer zone provision to prohibit building at the edge of the wetlands.

A project on Route 1 in Norwood (Proposed Retail Project, EOEA #10974) has received attention from the watershed association and state agencies due to encroachment into wetland areas. Stronger enforcement of existing regulations, and stronger local regulations, are needed to protect wetlands in the Norwood ACEC. Norwood has recently hired a Conservation Agent and this should enable the town to improve its wetlands protection efforts.

The new Massachusetts Rivers Protection Act does not obviate the need for undisturbed wetland buffer zones in the ACEC because there are still critical wetlands in the ACEC that fall outside of the areas covered by the Act. The Rivers Protection Act essentially expands the Wetlands Protection Act to include protection for a 200-foot riparian zone, known as the "Riverfront Area," on either side of rivers and perennial streams.[4]

Conservation Commissions can include continuing conditions within their Orders of Conditions and Certificates of Compliance to require that certain long-term actions be conducted (e.g., monitoring, maintenance, use of minimal amounts of salt, fertilizers and pesticides). For example, Canton's Conservation Commission Rules and Regulations specifies continuing conditions in the Certificate of Compliance, and requires the Certificate to be recorded in Land Court or the Registry of Deeds (sec. 1.05(8)(e).

Local Conservation Commissions have a key role to play in ensuring that stormwater runoff from newly developed or redeveloped areas does not adversely impact sensitive wetland areas. The Department of Environmental Protection issued a Stormwater Management Policy in November 1996 which establishes nine Stormwater Management Standards for stormwater discharges in wetland resource and buffer areas (see section 8.2.5 and Appendix D).

The DEP is requesting that Conservation Commissions begin applying the new policy and standards as soon as possible. DEP and the Massachusetts Office of Coastal

[4] Within the Riverfront Area, permits may not be granted for: 1) work that would result in a significant adverse impact; or 2) projects for which there is a practicable and substantially equivalent economic alternative with less adverse impacts. The DEP will amend 310 CMR 10.00 by August 1997 to incorporate the provisions of the Rivers Protection Act.

Zone Management published a Stormwater Handbook in March 1997 for use in implementing the stormwater policy and standards. MAPC recommends that Conservation Commissions become familiar with the new Stormwater Management Policy and Standards and discuss how and when they can begin to adopt them.

Wetlands restoration is a non-regulatory tool that can be used to improve the quality of wetlands in the ACEC. The Wetlands Restoration and Banking Program of the Executive Office of Environmental Affairs is working on a wetlands restoration plan for the Neponset River watershed. Program staff have identified degraded and destroyed wetlands in the Neponset River watershed and prioritized them based on their ability to improve the watershed in terms of water quality, fish and wildlife habitat and flood storage. EOEA will circulate a preliminary draft of the plan in spring 1997 and will bring the draft plan to the Neponset River watershed communities for their help in developing goals that can be incorporated into the final draft of the plan.

8.2.5 Stormwater Management and Regulation

It is important for local boards to keep in mind some major goals and guidelines for regulating stormwater. The following list, adapted from William Domey, P.E. of the Massachusetts Association of Health Boards, Inc., and the Buzzards Bay Project of Massachusetts Coastal Zone Management Office, may be helpful:

- Reproduce, as nearly as possible, the hydrological conditions in the ground and surface waters prior to development;
- Reduce stormwater pollution to the maximum extent possible, using Best Management Practices (BMPs);
- Utilize systems that have an acceptable future maintenance burden and ensure through routine scheduling, maintenance plans, and site inspections and enforcement, that systems are working properly;
- Have a neutral effect on the natural and human environment;
- Be appropriate for the site, given physical constraints; and
- Provide a sufficient level of health and environmental protection during the construction phase.
- Address rate, volume, and quality of stormwater runoff

- Ensure consistency of stormwater regulations among Planning Boards, Conservation Commission, and Boards of Health.
- Reduce uncertainty for the developer while allowing creativity and flexibility in meeting performance standards.
- Address existing stormwater problems by requiring improvement of stormwater management systems when sites are redeveloped.

In November 1996 the Department of Environmental Protection issued a Stormwater Management Policy that establishes nine Stormwater Management Standards for discharges into wetland resource areas and the wetland buffer zone (see Appendix D). In March 1997, DEP and the Massachusetts Office of Coastal Zone Management published the Stormwater Handbook for use in implementing the stormwater policy and standards. DEP is strongly urging local Conservation Commissions to begin applying the new standards during routine project review under the Wetlands Protection Act.

MAPC recommends that Conservation Commissions become familiar with the new standards and discuss how and when they can begin to adopt them.

The new Stormwater Management Standards are as follows:[5]

1) No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

2) Stormwater management systems must be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.

3) Loss of annual recharge to ground water should be minimized through the use of infiltration measures to the maximum extent practicable. The annual recharge from the post-development site should approximate the annual recharge from the pre-development or existing site conditions, based on soil types.

[5] Certain projects are exempt from the new standards (e.g., single-family house projects residential subdivisions with four or fewer lots if discharges will not affect a critical area; emergency road or drainage system repairs).

4) For new development, stormwater management systems must be designed to remove 80% of the average annual load (post-development conditions) of Total Suspended Solids (TSS). It is presumed that this standard is met when:
   a) Suitable nonstructural practices for source control and pollution prevention are implemented;
   b) Stormwater management best management practices (BMPs) are sized to capture the prescribed runoff volume; and
   c) Stormwater management BMPs are maintained as designed.

5) Stormwater discharges from areas with higher potential pollutant loads require the use of specific stormwater management BMPs. The use of infiltration practices without pretreatment is prohibited.

6) Stormwater discharges to critical areas must utilize certain stormwater management BMPs approved for critical areas. Critical areas are Outstanding Resource Waters (ORWs), shellfish beds, swimming beaches, cold water fisheries and recharge areas for public water supplies.

7) Redevelopment of previously developed sites must meet the Stormwater Management Standards to the maximum extent practicable. However, if it is not practicable to meet all the Standards, new (retrofitted or expanded) stormwater management systems must be designed to improve existing conditions.

8) Erosion and sediment controls must be implemented to prevent impacts during construction or land disturbance activities.

9) All stormwater management systems must have an operation and maintenance plan to ensure that systems function as designed.

If communities are interested in reviewing options for local stormwater regulation above and beyond the new Stormwater Management Standards, there are several model regulations available for review and consideration. The Buzzards Bay project of the Massachusetts Coastal Zone Management (MCZM) Office has developed a set of consistent stormwater regulations for Planning Boards, Boards of Health and

Conservation Commissions. The Massachusetts Audubon Society has developed model stormwater regulations for Planning Boards and Conservation Commissions. William Domey, P.E. of the Massachusetts Association of Health Boards, Inc., has developed a model stormwater regulation for Boards of Health.

8.2.6 Erosion and Sediment Control

Soil erosion from poorly stabilized streambanks, development sites and agricultural areas sends sediment-laden runoff into adjacent waterways. In urbanized areas, erosion is chiefly associated with construction. Stream bank erosion tends to increase as an area becomes more urban. As the imperviousness of an area increases, peak runoff rates and stream water velocities increase and the magnitude and frequency of floods increases. These changes contribute to stream bank erosion and higher sediment loads.

Too much suspended material has a deleterious affect on aquatic life. Phytoplankton, fish and invertebrates have difficulty breathing if sediment loads are too high. Suspended sediments reduce the amount of light that penetrates the water. This can kill underwater vegetation and can make it difficult for sight-feeding predators to capture prey. Excessive sediment loads clog catch basins and cause flooding of roads, and fill river channels, lakes, wetlands and reservoirs. Many other pollutants, including heavy metals, bacteria and organic chemicals, sorb to sediment particles and can harm aquatic life and human health. When suspended solids settle out, they can lead to lower dissolved oxygen levels and can contaminate the sediments with toxic chemicals. When settled sediments are disturbed and resuspended, these pollutants re-enter the water column.

Communities can limit the harmful effects of erosion and sedimentation through various mechanisms. As shown in Table 8-3, and as described in chapters 2 through 7, many of the ACEC communities have adopted provisions to address erosion control in their zoning bylaws, subdivision regulations and wetlands regulations.

The towns of Norwood and Sharon have adopted excellent erosion control measures that can provide a model for the other ACEC communities. Norwood has adopted erosion control provisions under the Environmental Requirements section of its zoning bylaw. The Norwood zoning bylaw includes performance standards, requires

the permanent stabilization of bare earth, authorizes the town to require performance bonds, and requires erosion control plans for developments above a certain threshold (the threshold is lowered for areas with steep slopes, highly erodable soils or other sensitive conditions). See section 5.3.1 of this report for more information on these provisions.

Sharon has adopted strong erosion control measures through its zoning bylaw, subdivision regulations and wetlands bylaw and regulations. These measures are summarized in section 6.3.

Another tool for addressing erosion and sedimentation is the adoption of a general bylaw. The Middlesex and Essex Conservation Districts have developed a model soil erosion and sediment control bylaw. This bylaw requires extensive land-disturbing activities to obtain a permit from the Conservation Commission, with detailed plans and specifications to avoid unacceptable erosion and sedimentation. Smaller projects are required to obtain limited permits. A copy of the bylaw can be obtained from the Natural Resource Conservation Service in Westford (508-692-1904).

Community officials should also be aware that stormwater permits from the Massachusetts Department of Environmental Protection are required for construction activities that result in the disturbance of five acres and have a point source discharge (through a pipe, ditch or swale) to a river, pond, stream, wetland or storm drain.

Communities looking for assistance with developing sediment and erosion controls should contact the Community Assistance Program of the U.S. Natural Resource Conservation Service at (508) 295-1481.

8.2.7 Other Regulatory Measures

Other regulatory measures that communities can utilize to protect the ACEC and other environmental resources include local hazardous materials bylaws, underground storage tank bylaws, and pet waste control regulations. Table 8-3 notes whether the six communities have adopted any of these measures.

This list does not include Board of Health measures, such as regulations more stringent than Title V, or septic system inspection and maintenance programs. Such

regulations and programs are important for unsewered areas in the ACEC, especially areas of older homes that have cesspools. One such area was identified in the Milton ACEC.

8.2.8 Local Practices

Roadway Maintenance: Street Sweeping, Catch Basin Cleaning and Road Salting

Roadway runoff routinely carries contaminants such as oil, gasoline, heavy metals, road salt, and sand into neighboring waterways. Hazardous materials being transported over roadways can damage water resources in the event of a serious accident. Local governments, the Massachusetts Highway Department and the MDC maintain and upgrade roadways within the ACEC. Practices such as catch basin cleaning, street sweeping and road salting have a direct effect on the amount of pollutants entering waterways.

Appendix E shows the schedules for street sweeping and catch basin cleaning, and Appendix F summarizes road salting practices for the six study communities and two state agencies that maintain roadways in the ACEC.

Roadways and catch basins have typically been designed to move the water off the roadway and into a collection system as efficiently as possible. The removal of pollutants has not been a consideration until fairly recently. The new Stormwater Management Policy and Standards discussed in Section 8.2.5 (and attached as Appendix D) apply to redevelopment of roadways as well as building sites and direct such projects to meet the standards to the maximum extent practicable and to at least improve existing conditions. "Redevelopment" includes "maintenance and improvements of existing roadways, including widening less than a single lane, adding shoulders, and correcting substandard intersections and drainage, and repaving..."

MAPC recommends that state as well as local highway departments integrate stormwater improvements into the design of roadway maintenance projects. New roadways should be designed with environmental protection, as well as safety, in mind. Remediation of stormwater runoff problems should also be considered if the town has identified a stormwater outfall that is causing a significant pollution

problem. Retrofits to existing drainage systems can markedly decrease the amount of pollutants entering a waterway. Grant funds are available on a competitive basis for remediating stormwater pollution problems. Grant programs include the section 319 program managed by DEP and the transportation enhancements program managed by the state transportation agencies and MAPC.

Street sweeping and catch basin cleaning can remove contaminants before they enter waterways. It is important to remove the accumulated sediment from the winter months as soon as possible before heavy and frequent spring precipitation.

Budgets for maintaining catch basins are always going to be constrained. It is important for roadway managers to prioritize basins and clean priority basins more frequently. Priority criteria should include the relative importance of nearby water resources (e.g., whether it is a drinking water resource, cold water fishery, swimming beach, shellfish bed), and the relative amount of debris (e.g., sand, leaves) an area typically receives.

Applications of road salt for highway deicing by state and local highway departments is an essential public safety measure, but the amount of salt used should be minimized by careful control of application rates. There are several major highways in the ACEC that receive significant amounts of road salt. The Massachusetts Highway Department utilizes straight road salt applications (not pre-mixed with sand) at a rate of 240 pounds per lane mile. MHD has not designated any reduced-salt areas within the ACEC. In general, groundwater must have sodium levels above 20 mg/l and be used as a drinking water supply before MHD will consider a request for a reduced-salt application area.

Towns should carefully manage their deicing programs to minimize the amount of salt applied, such as by mixing salt with sand at ratios ranging from 1:5 to 1:10 (salt:sand). Salt spreading equipment should be calibrated and maintained to apply deicing materials at the correct rate. Salt:sand ratios should be reduced, or sodium chloride substitutes used, in wellhead protection areas.

Salt storage practices and removal and stockpiling of plowed snow can also affect water resources. Salt should be stored in covered, sheltered areas on an impervious surface and should be located at least 100 feet from streams and floodplains. Plowed

snow stockpiles should be located on flat areas outside of the Zone II of drinking water supplies and at least 100 feet from streams, wetlands or floodplains.

Household Hazardous Waste and Waste Oil Collection

Improper disposal of household hazardous wastes and used motor oil can be a significant source of water pollution. Dumping of these materials into storm drains within the ACEC, and areas upstream of the ACEC, can impact ACEC resources.

As shown in Appendix G, all of the communities are sponsoring household hazardous waste collection programs, and several have additional programs for automotive wastes and/or waste oil. These programs should be continued.

9.0 Future Needs

This chapter discusses some of the additional work needed to understand and protect the Fowl Meadow ACEC. Because this project has focused on identifying land use issues and regulations, the suggestions in this chapter do not touch on many other critical aspects, particularly those related to the biological and ecological health of the ACEC.

9.1 Municipal Regulations

The communities need additional assistance to develop and refine the recommendations in this report into workable proposals that can be voted on by town boards and at town meetings. The MAPC has set aside funding to work with the Three Rivers on implementation of the report recommendations. A work plan has not yet been finalized for this project, but it will likely entail presentations of the findings and recommendations to town boards and development of model regulations (such as an ACEC regulation) that each community can tailor to its own needs.

An important issue that was not reviewed in this report is the need for intercommunity coordination on aquifer protection. All of the study communities with wells in the Fowl Meadow aquifer have adopted zoning overlay districts to protect their water supplies. In many cases, however, a town's district may not protect all of the recharge area for its wells because the recharge area extends beyond the town boundary and a community cannot adopt zoning outside of its borders. For example, a large portion of the Zone II (recharge area) for the Dedham-Westwood Water District's Fowl Meadow well lies within Canton, but Canton's aquifer protection district does not include this Zone II.

MAPC's 1990 Neponset Basin Water Supply Protection Study identified a high degree of interdependence in drinking water resources among the communities and recommended that the communities coordinate their efforts to manage and protect these resources. One of the main recommendations is that communities amend their aquifer protection zoning overlay district maps to include recharge areas for neighboring communities' water supplies.

In the short term, MAPC's follow-up implementation project for 1997 can provide some direction and assistance regarding regional coordination and cooperation for aquifer protection. In the long term, the Three Rivers Interlocal Council can provide an important forum for communities to work together on protection of regional water resources.

9.2 Technical Assistance for Town Boards

Local officials have a difficult job and need assistance in keeping up with and understanding the host of ever-changing rules and regulations. Conservation Commissions, in particular, have a crucial role to play in protection of the ACEC and have recently become responsible for implementing two new major initiatives: the Rivers Protection Act and the Stormwater Management Guidelines. DEP will be offering some training programs on the stormwater guidelines. Communities should take advantage of DEP training programs and other opportunities, such as workshops offered by the Massachusetts Association of Conservation Commissions. By working together on the Three Rivers Interlocal Council, the communities may be able to attract speakers or develop workshops or roundtables that address specific areas of need.

9.3 Coordination with Watershed Efforts

The Neponset River Watershed Association and the Executive Office of Environmental Affairs are developing a Neponset Basin-Wide Action Plan which will be finalized in spring 1997. This plan is being developed as part of the EOEA's watershed initiative, in which the Neponset River basin is serving as a prototype. The forthcoming action plan will contain specific recommendations for watershed "stakeholders," including town bodies, state agencies, watershed groups and others. It should prove an extremely useful tool for improving the state of the watershed and MAPC encourages town bodies to thoughtfully consider its recommendations.

The MDC will be releasing its Resource Management Plan for the ACEC for public review (as an Environmental Notification Form) in spring 1997. Among other things, the Resource Management Plan will provide information on natural resources, recreational facilities and historic and archaeological sites on MDC land within the ACEC. The plan will be an important document for towns and watershed activists

that want to better understand the natural, cultural and recreational resources in the ACEC.

The Neponset River Watershed Association has organized "stream teams" for the Fowl Meadow area and major tributaries of the Neponset. The stream teams have been conducting shoreline surveys and water quality monitoring to identify threats and pollution sources. Town boards, especially Conservation Commissions, can use the information gathered by the stream teams to better understand existing and potential threats to the health of the watershed.

9.4 An Information Guide to the ACEC

In order to protect the critical resources of the ACEC, local officials need to know what and where they are. Local officials need more baseline information about the ACEC, particularly where the critical resources are (e.g., drinking water wells, Zone II's, aquifer protection districts, rare wetlands habitats) and what regulations are in place to protect these critical resources. A recommendation that was discussed by the Three Rivers Interlocal Council and the Neponset River Watershed Association is the development of an information guide to the ACEC. The guide would explain the importance and show the location of critical resources and recreational resources and would provide information on local regulations and programs that protect the ACEC. The guide should be designed to be most useful to local officials and developers.

9.5 Public Education and Outreach

The public has a critical role to play in protecting the ACEC. Public support is needed to pass amendments to local bylaws and regulations that will protect the ACEC. Local officials, homeowners and developers need to understand what the critical resources are and how they can be protected.

Public education and outreach efforts can also include flyers or mailers (e.g., to be sent with water or tax bills) that provide information on such issues as proper disposal of waste oil and household hazardous waste, water conservation, proper septic system maintenance and environmentally responsible lawn care. With regard to water conservation, many people may not be aware that water conservation can have a positive effect on fish and wildlife and that low flows in the Neponset River are in

part due to water withdrawals and the fact that wastewater is transferred out of the basin to Boston Harbor rather than returned to the Fowl Meadow.

Storm drain stenciling is a public education effort to discourage illegal dumping into storm drains. Many people are not aware that storm drains lead directly to local rivers and streams. Messages such as "Do Not Dump: Drains to Neponset River" are painted onto storm drains. This practice has been used in some communities as an effective public education tool. A stenciling program could be conducted as a cooperative effort between the town Public Works Department and local volunteers from watershed groups, schools, churches, scouts, or civic groups. Alternatively, storm drain stenciling could be incorporated into regulations. The Dedham Conservation Commission's Rules and Regulations require storm drain stenciling in new developments (see section 3.3.3).

Information can be provided to businesses regarding proper storage and handling of hazardous materials, minimizing stormwater pollution and other issues. The Norwood Planning Director mentioned the "Green Wrench Program" which is a voluntary program aimed at automobile service stations. This program provides public relations benefits to businesses while encouraging environmentally sound practices.

9.6 Ongoing Stewardship of the ACEC

Successful stewardship of the ACEC will require a coordinated effort on the part of interested organizations, agencies, boards and individuals. An ongoing group to help monitor and coordinate overall stewardship of the ACEC, working with the Neponset River Watershed Association, DEM's ACEC Program, MDC, the Three Rivers Interlocal Council, Friends of the Blue Hills, town boards and others, could help ensure ongoing protection of critical ACEC resources. One of the roles of such a group might be to track and comment on the several pending major projects in the ACEC.

9.7 Restoration and Remediation

Restoration of degraded and destroyed wetlands is an important future goal for the watershed and can help improve the environmental quality of the ACEC. As

discussed in section 8.2.4, communities and watershed associations will soon have an opportunity to participate in setting goals for a wetlands restoration plan for the Neponset River watershed, developed by the Wetlands Restoration and Banking Program of the Executive Office of Environmental Affairs.

Remediation projects to clean polluted stormwater is also an important future need. There are a few state and federal grant programs that provide funds to remediate polluted stormwater (especially the Section 319 program managed by DEP and the "enhancements" program managed by state transportation agencies and the MAPC). To participate in these competitive grant programs, communities need to identify specific problems (e.g., highway runoff) that are known to be affecting specific resources (e.g., critical wetlands or wildlife habitat in an ACEC), and have a plan for remediation (e.g., installation of a stormwater treatment system).

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U.S. Department of Transportation and Massachusetts Highway Department. I-95/I-93 (Route 128) Transportation Improvement Project: Wellesley to Randolph. Environmental Assessment/Draft Environmental Impact Report (EOEA 5072). June 1996.

II. Zoning Bylaws, Zoning Maps, General Bylaws, and Local Regulations

Canton

Subdivision Rules and Regulations. Revised to April 7, 1981.
Wetlands Protection Bylaw and Regulations. Revised to November 18, 1995.
Zoning By-Laws. Amended through Spring Town Meeting, 1995.
Zoning Map. Revised to February 1996.

Dedham

Conservation Commission Rules & Regulations, Adopted April 4, 1996.
General Wetlands Protection Bylaw, Chapter XXVIII, Amendment passed at April 8, 1996 Annual Town Meeting.*
Rules and Regulations for the Subdivision of Land in Dedham, Massachusetts. Revised to March 16, 1992.
Zoning By-law. Revised to November 1, 1995.
Zoning By-law amendment adopted at April 8, 1996 Town Meeting:. Section II-5, Flood Plain Districts (Article 76).*
Zoning Map. Revised to May 9, 1995.

Milton

Conservation Commission, Non-Disturbance Zone Regulation, Adopted September 11, 1995.
General Zoning Bylaws and Wetlands Bylaws of the Town of Milton, As amended through the 1995 Annual Town Meeting.
Rules and Regulations of the Planning Board, Amended through February 3, 1994.
Zoning Map. [*Note:* Revision date illegible on map copy (August 1986?). Used version of map that was current as of February 1, 1996.]

Norwood

* As of this writing, this bylaw amendment had not yet been approved by the Massachusetts Attorney General's Office.

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Rules and Regulations Governing the Subdivision of Land in the town of Norwood, Massachusetts. Revised May 11, 1992.
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Sharon
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Zoning By-Laws. As amended through September, 1992. Separate updates provided from May 1993, September 1993 and May 1994 Town Meetings.

Westwood
Rules and Regulations Governing the Subdivision of Land in the Town of Westwood, Massachusetts. July 8, 1991.
Zoning Bylaw. May 2, 1995.
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III. Personal Communications**

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Norwood
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Costello, Stephen M. Planning Director. January 31, 1996; March 19, 1997.
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Welch, Joseph M. Superintendent, Department of Public Works. January 31, 1996.

** Note: Personal communications were with Mary Ellen Schloss, Chief Environmental Planner, Metropolitan Area Planning Council, and consisted of in-person and telephone interviews and written correspondence between January 1996 and April 1997. A few of these communiciations were meetings with town committees, specifically the Norwood Conservation Commission and the Westwood Land Use Committee.

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Sharon

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Westwood

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Bleday, Maureen. Business Liaison. February 29, 1996.
Champaign, Joseph. Town Engineer. February 29, 1996.
Chiofolo, Marie. Planning Board Administrator. February 29, 1996.
Haas, Robert. Chief, Police Department. February 29, 1996.
Kerivan, George. Chairman, Conservation Commission. February 29, 1996.
Levenson, Peter. Building Commissioner. February 29, 1996.
Peterson, Ruthann. Zoning Board of Appeals Administrative Assistant. February 29, 1996.
Shea, Linda. Health Director. February 29, 1996.
Sheehy, John. Chief, Fire Department. February 29, 1996.
Walsh, Timothy. Director, Department of Public Works. February 29, 1996.

Other

Cooke, Ian. Executive Director, Neponset River Watershed Association. March 21, 1996.
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Silveira, Steve. Massachusetts Bay Transit Authority. Planning Department. February 4, 1997.
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Wollenhaupt, John. Massachusetts Highway Department, District Highway Maintenance Engineer, District 4. January 8, 1997.

Appendices

Appendix A: Dedham Conservation Commission Rules & Regulations

Appendix B: Sample ACEC Bylaws and Regulations

B-1) Easton Conservation Commission Rules & Regulations, Part IV: Variances

B-2) Mashpee Zoning Bylaw, Article XIV: Areas of Critical Environmental Concern

Appendix C: Sample Conservation/Open Space Zoning Districts

Appendix D: DEP Stormwater Management Policy and Standards

Appendix E: Local Practices

E-1) Schedules for Street Sweeping and Catch Basin Cleaning

E-2) Road Salting Practices

E-3) Household Hazardous Waste and Waste Oil Collection Programs

APPENDIX A

Dedham Conservation Commission Rules & Regulations

Adopted April 4, 1996

The TOWN OF DEDHAM

COMMONWEALTH OF MASSACHUSETTS

CONSERVATION COMMISSION RULES & REGULATIONS

ADOPTED APRIL 4, 1996

SECTION 1. AUTHORITY

a.) The rules and regulations contained herein have been adopted by the Dedham Conservation Commission in accordance with Section 9 of the Town of Dedham General Wetlands Protection Bylaw.

b.) Nothing in these rules and regulations is intended to replace or conflict with the requirements of the Town of Dedham General Wetlands Protection Bylaw or the Town of Dedham Floodplain Zoning Bylaw.

SECTION 2. MEETINGS

a.) Meetings will usually be held at the Dedham Town Hall located on 26 Bryant Street. However, from time to time, it may be necessary for the Conservation Commission to meet at one of the other public buildings within the Town.

b.) All scheduled meetings, at which public hearings will occur, shall have their agenda posted in the Dedham Town Hall and the Dedham Public Library. Information about meetings can be obtained at the Conservation Commission Office or the Town Clerk's Office at Town Hall during regular business hours.

c.) In addition to meetings at Town Hall, the Conservation Commission may schedule meetings at various project sites for the purpose of observing conditions first hand. The time of such site meetings will be announced at the time of the public hearing held during a scheduled meeting of the Conservation Commission. Such site visits shall be open to the public at the property owner's discretion.

SECTION 3. FILING DEADLINES

All items that require public hearings before the Conservation Commission must be filed with the Conservation Commission Office a minimum of ten (10) business days prior to the date of the meeting. This is to allow for adequate time for advertising and abutter notification as well as review of the filing.

SECTION 4. ABUTTER NOTIFICATION

a.) Prior to the start of a public hearing, all abutters shall be notified in accordance with the Massachusetts Wetlands Protection Act and the Town of Dedham Wetlands Protection Bylaw.

b.) It is the responsibility of the applicant to notify all abutters in accordance with the Abutter Notification Guidelines published by the Massachusetts Department of Environmental Protection, April 1994. In addition, the Conservation Commission will require the applicant to notify abutters to abutters in cases where the abutters to abutters are located within 300 feet of the project site. Notification of abutters to abutters may be waived by the Conservation Commission in cases where it feels that this requirement may place an undue hardship on an applicant. The applicant shall submit the return receipts from the certified letters to the Conservation Commission as proof of notification.

c.) The Conservation Commission shall place a legal notification in the Daily Transcript. The applicant shall be billed directly for the cost of the legal notice.

d.) Re-notification of abutters and re-advertisement in the newspaper will not be required for cases where a public hearing is opened and continued to a later meeting date. Re-notification will also not be required in cases where a meeting is postponed due to a lack of a voting quorum or inclement weather.

SECTION 5. PUBLIC HEARINGS

a.) Public hearings shall be held at the time shown on the posted agenda. If an earlier hearing is still in progress, at the posted time for a hearing, the hearing shall be held at a later time during the meeting, in accordance with the order on the posted agenda. Under no circumstances shall a public hearing be opened or held at a time earlier than that shown on the posted agenda.

b.) The typical format for a public hearing shall be as follows. The hearing will start with a presentation by the applicant and or his representative. Following this presentation, the Conservation Officer shall report on his/her review of the project and any additional comments regarding the application. The Conservation Commissioners shall ask any questions that they may have regarding the project. Following questions by the Commissioners, the public will be allowed to ask questions and comment on the proposed project.

c.) If the Conservation Commission requires additional information prior to closing a public hearing, it may request an applicant to grant a continuance of the public hearing to a later meeting date. Reasons for continuances include providing additional plans, calculations, or other data requested by the Conservation Commission or to allow the Commission to schedule a site visit. Failure to provide adequate information to the Commission may result in the denial of an application.

SECTION 6. VOTING QUORUM

a.) A minimum of four eligible members of the Conservation Commission is required as a quorum in order to open a meeting or public hearing of the Conservation Commission. Any Commissioner may sign an Order of Conditions or a Determination of Applicability, even if he/she had not voted in favor of the application.

b.) An application must receive affirmative votes by a majority of the Conservation Commission members present. A minimum of four Commissioners must sign an Order of Conditions or Determination of Applicability in order for the document to be valid.

c). In cases where a public hearing occurs over the course of several meetings, members need not be present for the entire public hearing in order to vote on a given application.

d.) In cases where there is a tie vote, the application is not approved.

SECTION 7. COMMISSION OFFICERS

a.) Each year, the Conservation Commission shall elect from their ranks members to fill the following positions: Chairman, Vice-Chairman, and Clerk.

b.) The Chairman is responsible for calling a meeting to order. The Chairman is also responsible for addressing the scheduled agenda items in a timely manner and for maintaining order at the public meetings.

c.) The Vice-Chairman is responsible for assuming and administering the responsibilities of the Chairman at times when the Chairman is not present.

d.) The Clerk is responsible for overseeing the keeping of minutes of public meetings as well as correspondence to and from the Conservation Commission. In the event that both the Chairman and Vice-Chairman are absent from a meeting, the Clerk shall assume the duties and responsibilities of the Chairman.

SECTION 8. BUFFER ZONE REGULATIONS

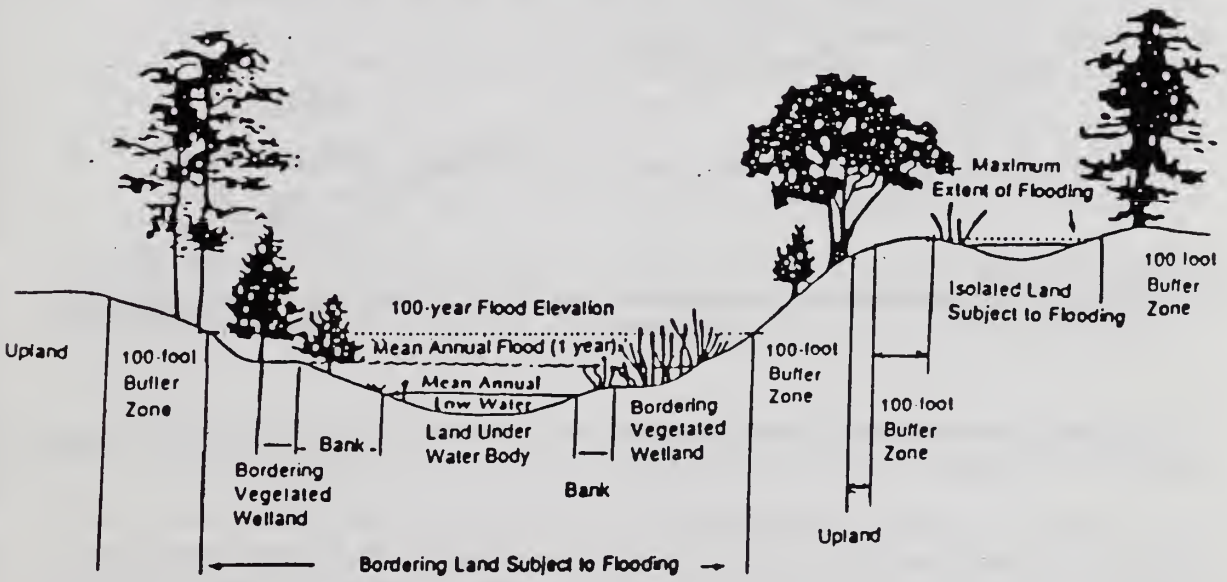

FIGURE 1. TYPICAL CROSS-SECTION THROUGH A RESOURCE AREA SHOWING BUFFER ZONES.

a.) The purpose of the following regulations is minimize any impact which any proposed work may have on any Resource Area protected by the Town of Dedham General Wetlands Protection Bylaw. The Dedham Conservation Commission presumes that the 100 foot Buffer Zone is relevant and important to the protection of any Resource Area protected by this Bylaw. An cross-section of a typical Resource Area and Buffer Zone is illustrated in Figure 1. Buffer Protection will be accomplished, in part, through the control and regulation of proposed work which will occur within the 100 foot Buffer Zone bordering a Resource Area.

b.) The following activities shall maintain a minimum depth of Undisturbed Buffer Area from the delineated edge of the adjacent Resource Area based upon the following formula:

Undisturbed Buffer Area (UBA) = Slope x Usage Factor

where the Undisturbed Buffer Area (UBA) value is the required minimum depth of the Undisturbed Buffer from the edge of the Resource Area. The Slope value is the average slope across the 100 foot buffer zone, expressed in terms of percent (%), and the Usage Factor is taken from the table below. The greater of the value calculated using this formula or the value stated in the table in section 8.c shall be utilized in determining the minimum Undisturbed Buffer Area. Figure 2 below illustrates the slope dimension to be utilized in calculating the UBA.

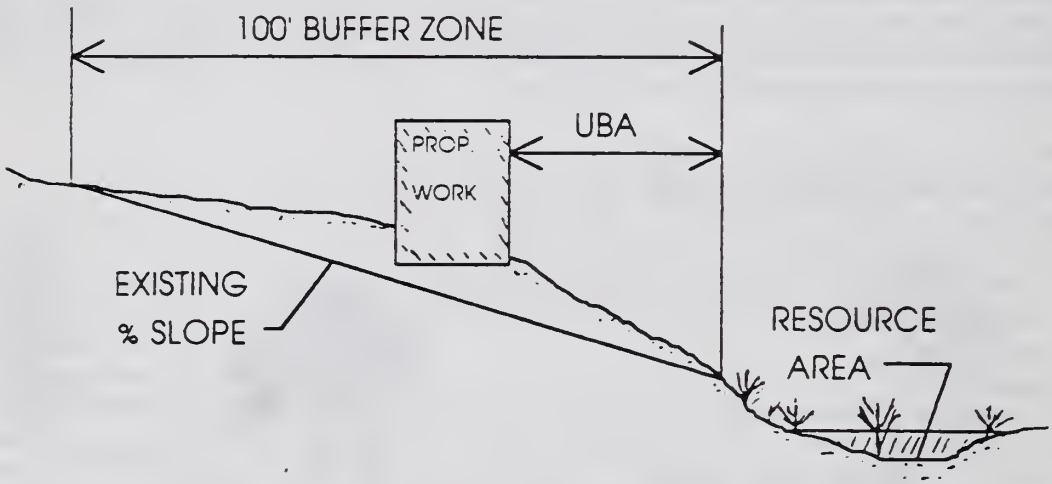

FIGURE 2. ILLUSTRATION OF SLOPE DIMENSION UTILIZED IN CALCULATION OF UNDISTURBED BUFFER AREA.

c.) The following values will be utilized for calculating the required minimum Natural Buffer depth from the edge of the Resource Area:

USAGE	USAGE FACTOR*	MIN. UBA
Agriculture (commercial farming)	4	20'
Single Family Residence and accessories	6	30'
Commercial / Retail / Industrial / Institutional / Multi-Unit Residential Building / Subdivisions	8	40'
Paved Parking Lots and Access Ways	10	50'
Gasoline Stations. Automotive Maintenance & Petroleum Storage Facilities	15	75

* Usage Factors and Minimum UBA shall be increased by 50 percent for areas which contain USDA NRCS Hydrologic Group "D" soils.

d.) Exceptions.

1. On lots which have been previously developed, the existing limit of development will serve as the depth of the Undisturbed Buffer Area where the distance between the Resource Area and existing man-made structure(s) is less than that which would be calculated in sections 8.b and 8.c above. This exception shall only apply if the new use of the site is similar to the previous use or if the site use is being changed to single family residences. The criteria for determining if a new use is similar is that which is outlined in the Town of Dedham Zoning Bylaw.

2. The man-made structures which would qualify to delineate an existing limit of development include such items as buildings, paved parking areas, retaining walls not associated with a discharge pipe. Existing drainage structures, such as culverts and discharge trenches will not be utilized to determine the existing limit of development.

3. Wetland or Flood Plain Replication/Restoration areas and associated grading and landscaping may be located within the Undisturbed Buffer Area.

e.) No work shall be conducted within the Undisturbed Buffer Area with the exception of removal of debris or other maintenance / restoration work as instructed or approved by the Conservation Commission. Such exceptions may be granted for planting and landscaping within this area.

SECTION 9. VERNAL POOLS

a.) The purpose of the following regulations contained within this section is to help ensure adequate protection to Vernal Pools. Vernal Pools have been identified as being vital breeding habitats for several species of Fairy Shrimp, Wood Frogs, and various varieties of Mole Salamanders. Preservation of Vernal Pools is vital to the survival of these species.

b.) This section presumes that all seasonal ponds are Vernal Pools unless the area has been studied and documented to show that it does not function as a Vernal Pool.

c.) The following setback distances shall be required from all documented and presumed Vernal Pools:

Edge of Clearing/Landscaping	50'
Edge of man-made structures (including pavement & buildings)	75

The above setbacks are based on the requirement to maintain a natural undisturbed area around Vernal Pools to prevent disturbance of breeding habitats.

d.) A Vernal Pool may be documented using the procedure outlined by the Commonwealth of Massachusetts Natural Heritage and Endangered Species Program Copies of the necessary forms and maps may be obtained from the Conservation Office

SECTION 10. FILING REQUIREMENTS

a.) Number. Ten copies of all applications, plans, calculations and associated documents shall be required to be submitted to the Conservation Commission at the time of filing. This is to allow a copy for each member of the Commission, the Conservation Officer, and two copies for the office files. A filing shall not be considered complete until the specified number of copies have been submitted.

b.) Mailing Copies to Commission Members. The applicant for any project which requires a General Wetlands Protection Bylaw filing fee in excess of fifty ($50) dollars, shall be responsible for delivering the aforementioned copies of the application and all supporting plans and documents to the residence of each member of the Conservation Commission. This delivery shall be done by either U.S. Mail or a commercial package delivery company. The applicant shall be responsible for all costs incurred for delivery. The packages shall be sent or mailed on the same day that the project application is filed with the Conservation Commission office.

c.) Projects Where Mailing to Commission Members is not Required. The applicant of any project which requires a fee of fifty ($50) dollars or less under the General Wetlands Protection Bylaw shall not be required to deliver copies of the application and all supporting plans and documents to each member of the Conservation Commission. In such cases, the applicant shall deliver all copies directly with the Conservation Commission office at the time the application is filed. This delivery may be done by hand, US. Mail or a commercial package delivery company.

SECTION 11. PLANS

a) Size All plans shall be a minimum size of 8.5 by 11 inches to a maximum size of 24 by 36 inches. All plans must be submitted folded to such a size that they will fit in a standard letter size file.

b.) Scale. All plans shall be drawn at a scale of one inch equals forty feet (1"=40') or larger. For large projects which involve work in a Wetland Resource Area or Buffer Zone in only an isolated area, a smaller scale may be used, provided that a detail plan is of the work in the Wetland Resource Area or Buffer Zone at a scale of one inch equals twenty feet (1"=20') or larger is included.

c.) Professional Certification. All site plans shall be stamped by either a Professional Land Surveyor and/or Professional Engineer (Civil or Environmental disciplines) licensed by the Commonwealth of Massachusetts.

d.) The following information is required for all plans which accompany the filing of a Notice of Intent:

1. Title Block: All plans shall include a title block which lists the name of the project, owner's name and address, applicant's name and address, engineer's name, address, telephone number, plan date, revision date(s), and plan scale.

2. Resource Area Information: All plans shall show the limit of the resource area as delineated in the field by the applicant's wetland consultant. This delineation shall indicate any flags or other markers set in the field to locate the resource area. Additionally, the edge of any water body or waterway shall be shown along with the date on which it was located. The limit of the 100 foot Buffer Zone shall also be delineated on all plans. Where applicable, the limits of any Wetlands Restriction Areas or areas designated as floodplain on the FEMA/FIRM map shall be shown on the plans.

3. Topography: Existing and proposed contours at 2 foot vertical increments shall be shown on all plans. All topographic information shall be referenced to U.S.G.S. Mean Sea Level or Town of Dedham datum. All topography shall be labeled in such a manner as to clearly indicate the contour elevation and to differentiate between existing and proposed contour lines. Reference benchmarks shall be noted on the plan with location and elevation.

4. Structures & Utilities: All existing and proposed structures shall be shown and appropriately labeled on the site plan. All utilities, including utility poles, which are located within the area of the proposed work shall be located and shown. Existing and proposed drainage structures and pipes shall be labeled to indicate invert, size, and slope.

e.). Landscape / Vegetation Plans. All site plans for multi-family residential, commercial, and industrial projects shall include a landscape plan which shall show landscaped areas and proposed plantings, indicating location and type of all proposed vegetation. Additionally, any project which involves the alteration of a resource area shall include a landscape plan as outlined in this section.

f.) As-Built Plans. It has been the Dedham Conservation Commission's ongoing policy to require as-built plans for most projects which receive Order of Conditions. As-built plans require the following items:

1. Certification: All as-built plans shall contain a statement certifying that the work performed has been done in conformance with the Order of Conditions issued by the Dedham Conservation Commission. This certification shall be accompanied by the signature and stamp of a Professional Engineer (Environmental or Civil disciplines) or a Registered Land Surveyor licensed by the Commonwealth of Massachusetts. A further certification shall state that the information contained on the as-built plan has been obtained through an actual field survey of the project.

2. Limit of Work: As-built plans shall delineate the limits of grading, clearing, and construction performed by the project. The as-built plan shall contain the total area in square feet of Resource Area and or Buffer Zone which have be altered by the work.

3. Topography: As-built plans shall show the finished grades of the project. Benchmark references shall be provided as outlined in section d.3 above.

4. Structures and Utilities: All structures and utilities constructed or altered as part of the project shall be shown on the as-built plan. Details such as floor and sill elevations for structures and inverts, pipe sizes, materials and slopes shall be included for all drainage and sewage utilities constructed.

SECTION 12. DRAINAGE DESIGN AND CALCULATIONS

a.) Projects Requiring Calculations. Any project which involves the use of underground drainage structures or will involve more than 5000 square feet of land which drains towards a Resource Area shall require drainage calculations prepared by a licensed Professional Engineer. Also, any multi-family residential, commercial, or industrial project involving the construction of an access road or parking lot shall require drainage calculations prepared and stamped by a Professional Engineer licensed in the Commonwealth of Massachusetts in the Civil, Environmental, or Hydrogeologic disciplines.

b.) Methodology. Drainage calculations shall be prepared using one of the following methods:

1. Rational Method (for sites less than 40,000 s.f. in size)

2. TR-55

3. TR-20

c.) Calculations shall be performed for existing site conditions (pre-development) and proposed site conditions (post-development) based on the proposed site plan. Storms of 2, 10, 25, and 100 year frequency events shall be analyzed.

d.) Zero Runoff Rate Increase. Detention / Retention systems shall be designed to achieve a zero increase in peak runoff rate between pre-development and post-development site conditions for all four storm events analyzed. This requirement can be waived if the

Applicant's Engineer can demonstrate that an increased runoff rate will not have a detrimental effect on surrounding and downstream properties.

1. The point of discharge or downgradient property boundary shall be utilized as a design point for calculating runoff rates. This may include several different discharge points or boundaries dependent on the existing and proposed topographic features of the project site.

e.) Zero Runoff Volume Increase. Projects which discharge runoff directly into areas designated as 100 Year Floodplain Districts by FEMA shall be required to demonstrate a zero increase in stormwater runoff volume for the 100 year frequency storm. This may be accomplished through stormwater retention or by increasing the floodplain storage volume by a volume equal to that of the additional stormwater runoff.

f.) Drainage Design Criteria. The following design criteria shall be utilized for the specified drainage system components:

1. All detention/retention basins shall be designed based on a 100 year frequency storm. Basins shall utilized staged outlets to achieve a Zero Runoff Rate increase for each of the four storm events analyzed.

2. Basin volume below the 100 year floodplain elevation shall not be counted towards the detention/retention volume. Such areas are assumed to be below the high mean groundwater elevation and thus will be incapable of storing stormwater runoff

3. All street drainage (roads which are or may become public ways) shall be designed based on a 25 year frequency storm.

4 Culverts which will pipe streams or natural drainage channels shall be sized based on a 100 year frequency storm.

5. Parking lot and driveway drainage shall be designed based on a 10 year frequency storm.

6. All pipe sizes shall be calculated based on the Rational method.

g.) Water Quality. The following Stormwater Quality Performance Standards are based on the March 1996 draft policy issued by Mass. D.E.P. A list of Best Management Practices to help achieve the following standards is included in Section 13 of these Rules and Regulations.

1. All new stormwater conveyances (outfalls/discharges) shall not discharge untreated stormwater directly into or cause erosion in Resource Areas protected under the Dedham General Wetlands Protection Bylaw, Vernal Pools, or the 100 foot Buffer Zone to such areas.

2. Existing stormwater conveyances shall be modified to comply with this regulation where deemed practical by the Conservation Commission. Such cases may be associated with the redevelopment of a previously developed site.

3. The annual groundwater recharge from the post-development site shall be approximately equal to or greater than the annual groundwater recharge from the existing site. This shall be determined using soil classification and ground cover as a design basis. The following table derived from NRCS County Soils Survey shall be utilized in design of ground water recharge:

HYDROLOGIC GROUP	VOLUME TO RECHARGE (x Total Impervious Area)
A	0.40 inches of runoff
B	0.25 inches of runoff
C	0.10 inches of runoff
D	waived (usually unbuildable)

Soils at planned points of stormwater runoff infiltration must be investigated and confirmed for adequate permeability, due to the generalized nature and the possibility of "inclusions" within some mapped NRCS soil units.

4. Stormwater management systems associated with new conveyances shall be designed to remove eighty percent (80%) of the average annual load of Total Suspended Solids based on proposed post-development conditions. Calculations shall be provided showing that the proposed system meets this design criteria.

5. The first inch of runoff from all impervious surfaces shall be retained and treated by the stormwater management system. Calculations shall be provided showing that the proposed system meets this design criteria.

6. The Commission may require additional stormwater management for projects which may generate higher potential pollutant loads. Such projects may include service stations, convenience stores, fast food restaurants, or other projects which may involve servicing of motor vehicles or may generate a high number of daily vehicle trips.

7. Erosion and sedimentation controls shall be required as part of any proposed construction or earthwork activities. An erosion and sedimentation control plan shall be required as part of any Notice of Intent filing with the Conservation Commission.

h.) Maintenance Schedule. Any project which involves the use of drainage structures, including swales and ponds, shall include a scheduled maintenance plan. Details of such a maintenance plan shall be incorporated onto the plans submitted to the Conservation Commission. Such maintenance plans shall be designed to ensure that Water Quality standards are met throughout the year.

i.) Computer Data. The applicant's Engineer shall furnish the Conservation Commission with copies of any data files utilized in the performance of required drainage calculations. Data shall be furnished on 3.5" (720K, 1.44MB), 5.25" (360K, 1.2MB) disks, IBM formatted or

on standard width QIC 40/80 tapes. Disks and tapes shall be incorporated into the permanent files of the Commission.

SECTION 13. BEST MANAGEMENT PRACTICES

a.) Purpose. The Dedham Conservation Commission is implementing the following best management practices in order to improve the water quality of the various streams, rivers, and water bodies located within the Town limits and downstream therefrom. This is being done in part to meet forthcoming standards being issued by the U.S.E.P.A. which will require the Charles and Neponset Rivers to meet clean water standards for fishing and swimming. Stormwater runoff has been identified as the major contributing factor to pollutants within the various water bodies located within the Town of Dedham.

b.) Additionally, of great concern to the Town of Dedham is the potential contamination of groundwater supplies. Presently most of the Town's drinking water is produced by wells located within the Town limits. Therefore, the best management practices outlined here shall also apply to proposed drainage systems which utilize detention and groundwater recharge as a method of runoff mitigation.

c.) The following mitigation measures may be required, including but not limited to the following, in order to improve the quality of stormwater runoff or groundwater discharge:

1. Oil hoods in catch basins.

2. Oil and Gasoline separation chambers in drainage systems prior to discharge into a resource area or drainage basin.

3. Use of salt alternatives for de-icing of roadways, sidewalks and parking areas.

4. Limiting the use of fertilizers or requiring the use of low nitrogen fertilizers.

5. Check dams in drainage swales to reduce the volume of suspended sediments.

6. "Wet" detention ponds to promote nutrient absorption.

7. Elimination and replacement of invasive plant species within wetland mitigation areas. Such species shall be those classified as invasive by the Massachusetts Department of Environmental Protection.

8. Minimizing the amount of impervious area on a site.

9. "Staged" detention pond systems to reduce the volume of suspended solids in runoff discharge by providing a multi-stage sedimentation system.

10. Velocity reduction devices on stormwater discharge pipes.

11. New technologies aimed at the reduction of stormwater and groundwater contamination.

SECTION 14. REQUESTS FOR DETERMINATION AND DETERMINATIONS OF APPLICABILITY

a.) The Conservation Commission shall require any person wishing the Commission to determine whether a property or proposed project will come under the jurisdiction of the Conservation Commission to file a Request for Determination of Applicability.

b.) Any person who feels that a proposed project falls within the jurisdiction of the Conservation Commission may file a Notice of Intent without first filing a Request for Determination.

b.) The Conservation Commission can issue a Negative Determination of Applicability with special conditions attached. This can be done for projects which will involve work within the 100 foot Buffer Zone to a Resource Area where the Commission feels that the project poses only a minimum porential of adversely impacting the bordering Resource Area. Such special conditions may include items such as requiring the placement of erosion control barriers or regulating the stockpiling of materials.

SECTION 15. NOTICES OF INTENTS

a.) The Conservation Commission shall require any person wishing to perform work which will impact a Resource Area protected under the General Wetlands Protection Bylaw to file a Notice of Intent.

b.) Any person who is unsure whether a proposed project will impact a Resource Area may file a Request for Determination of Applicability with the Conservation Commission.

SECTION 16. DESIGN STANDARDS & POLICIES

All projects shall be designed to meet the following design standards and policies adopted by the Dedham Conservation Commission.

a.) BERMS: All berms which shall be located in areas subject to the Commission's jurisdiction shall meet the following standards:

1. All berms shall be composed of granite or concrete.

2. Berms shall be imbedded to a depth of at least 12 inches and shall project not less than 6 inches above the surface.

3. An earthen shoulder shall be constructed to be flush with the top of the berm and shall extend out a minimum of 2 feet behind the berm.

b.) DRAINAGE: All drainage structures located in areas subject to the Commission's jurisdiction shall meet the following standards:

1 All catch basin grates shall be etched with the following statement: "Water from this catch basin discharges into (name of water body or water way). Please do not dispose of waste oils or chemicals in this structure".

2. All proposed drainage systems shall include oil and gasoline separation chambers prior to discharging into any wetlands, water bodies, or municipal drainage system.

3. All existing drainage systems shall be upgraded to include oil and gasoline separation chambers prior to discharging into any wetlands, water bodies, or municipal drainage system.

c.) DUMPSTERS: All dumpsters located in areas subject to the Commission s jurisdiction shall meet the following standards:

1. Wherever site conditions allow, dumpsters shall be located outside the 100 foot Buffer Zone to any Resource Area protected by the General Wetlands Protection Bylaw.

2. All dumpsters shall be placed on a concrete or bituminous concrete pad. Exceptions will be made for dumpsters temporarily placed on the site during the course of a project approved by the Commission.

3. All dumpsters shall be enclosed by a solid fence at least six (6) feet in height. Exceptions may be made for dumpsters temporarily placed on the site during the course of a project approved by the Commission.

4. Proposed dumpster locations shall be shown as part of any site plan filed with the Conservation Commission.

SECTION 17. HAZARDOUS MATERIAL CONTINGENCY PLAN

a.) Outlines for a Hazardous Materials Contingency Emergency Response shall be provided for the following:

1. Any project containing or abutting to a site which is undergoing or has undergone a Phase I site evaluation and cleanup.

2. Any project containing or abutting to a site on which is listed in the DEP Spill's Database.

3. Any project located on a site which was formerly in industrial or automotive-related use.

b.) The Outline shall contain the following information:

1. Names, addresses, work and home telephone numbers of the following: Property Owner, Project Engineer, General Contractor, Excavation Subcontractor (if any).

2. Name, address, and telephone number of the environmental service company to be used should soil or groundwater contamination be encountered.

3. Location where polypropylene tarps or other acceptable impervious material on which any excavated contaminated soil may be stored.

4. A list of the notification and action procedures which are to be followed in case contaminants are encountered.

c.) Copies of this Outline shall be kept on site at all times and provided to all sub-contractors, The Dedham Conservation Commission and the Dedham Fire Department.

SECTION 18. WAIVERS

a.) The Conservation Commission shall have the discretionary authority to grant waivers to any section of these Rules and Regulations.

b.) Any applicant may submit a written request to be granted such a waiver. Such a request shall be accompanied by an explanation or documentation supporting the waiver request and demonstrating that:

1. Strict application of the Rules and Regulations will result in an undue hardship.

2. Substantially the same level of protection to the Resource Areas protected by the Town of Dedham General Wetlands Protection Bylaw will be provided without strict application of the Rules and Regulations.

c.) All waiver requests shall be discussed and voted on at the public hearing for the project.

d.) If in the Commission's opinion, additional time or information is required for review of a waiver request, the Commission may request to continue a hearing to a date certain announced at the meeting. In the event the applicant objects to a continuance or postponement, or fails to provide requested information, the waiver request shall be denied.

APPENDIX B

Sample ACEC Bylaws and Regulations

B-1) Easton Conservation Commission Rules & Regulations, Part IV: Variances

B-2) Mashpee Zoning Bylaw, Article XIV: Areas of Critical Environmental Concern*

Note: Appendix B-2 is an exceprt from the Mashpee Zoning By-Law that was downloaded from the MuniLaw database program in June, 1996. Any errors, of ommission or otherwise, originate from the MuniLaw database.

PART IV. VARIANCES

4.01 VARIANCES

(1) The Conservation Commission may, in its discretion, grant variances from the operation of one or more of the provisions of this by-law, or the rules and regulations promulgated thereunder. Such variances are intended to be granted only in rare and unusual cases, upon a showing of clear hardship relating to the subject premises if the desired relief is not granted.

(2) The standards as set forth herein shall be the sole basis upon which a variance shall be granted.

(3) Applicants shall file a written request for variance at the same time as an Application for Permit or Request for Determination is filed with the Commission. Such variance request shall be made in letter form, and shall be a separate writing from the Application or Request forms.

(4) At any time subsequent to filing of the variance request but in no event less than five (5) business days prior to the date of commencement of the public hearing at which the variance request is to be considered, applicant or his/her/its representative shall submit to the Commission seven (7) copies of a brief in support of the variance request. Such brief shall include but not be limited to the following items:

a. A brief statement of the relief sought;

b. A description of all reasonably identifiable alternatives to the applicant's proposal which were considered by applicant and which would avoid or minimize the necessity of the requested relief, along with the reasons why such alternatives were deemed to be inadequate, unworkable or inadvisable;

c. A statement of all efforts which will be undertaken to minimize impact upon resource areas and buffer zone arising out of the work proposed;

d. Detailed plans for any mitigation measures proposed;

e. Adequate engineering and expert evidence to permit the Commission to evaluate the basis for Applicant's contentions in support of the variance requested;

f. Any and all relevant information which Applicant wishes the Commission to consider in deliberating the variance request.

(5) A variance may be granted only for the following reasons and upon the following conditions:

a. The Conservation Commission may grant a variance upon a clear and convincing showing by the applicant that any proposed work, or its natural and consequential impacts and effects, will not have any adverse effect upon any of the interests protected in the Bylaw. It shall be the responsibility of the applicant to provide the Conservation Commission with any and all information which the Commission may request orally or in writing, in order to enable the Commission to ascertain such adverse effects, and the failure of the applicant to furnish any information which has been so requested shall result in the denial of a request for variance.

b. The Conservation Commission may grant a variance from these rules and regulations when it is necessary to avoid so restricting the use of the property as to constitute an unconstitutional taking without compensation. If an application for a variance is received by the Commission, the Commission may request an opinion from Town Counsel as to whether the application of Article 29 to a particular case will result in a taking without compensation.

4.02 AREAS OF CRITICAL ENVIRONMENTAL CONCERN

(1) Areas within the Town of Easton which have been designated as Areas of Critical Environmental Concern by the Secretary of Environmental Affairs, Commonwealth of Massachusetts, are so designated due to the particularly unique environmental factors which impact upon such areas, and which highlight the unique importance of each area so designated.

(2) As a result of such designation, it is incumbent upon the Commission to be even more diligent in its review of projects proposed within such areas. The highest standards of scrutiny as to the impact of any proposal are required, and the Commission shall therefore require that a variance request as outlined in Section 4.01 of Article 29 be submitted with each such application.

(3) Further, it is herewith set forth relative to any and all proposed projects within such areas, that close scrutiny shall be given by the Commission to any proposals involving an application of new pavement or newly installed other impervious materials within any area less than one hundred (100) feet from Bordering Vegetated Wetland, Bank, Beach, and Meadow, and that the Commission will not look with favor on any such applications.

(4) In specific instances, the Commission will entertain a request for waiver from the above standard in Paragraph (3), such request to follow the form and utilize the standards set forth for a variance under Part IV., 4.01 herein.

ARTICLE XIV
Areas of Critical Environmental Concern (ACEC)

ction 174-84. Purpose.

The purpose of this Article is the protection of Areas of Critical vironmental Concern, areas of significance for flood control or the evention of storm damage, waters containing shellfish and fisheries d other public interests identified by the Wetlands Protection Act GL C. 131, Sections 40 and 40A) and the town's Wetlands Protection law.

ction 174-85. Geographical applicability.

This Article shall apply to all areas within the Waquoit Bay Areas Critical Environmental Concern (ACEC) as designated by the ssachusetts Executive Office of Environmental Affairs on vember 26, 1979, in accordance with MGL C. 21A, Section 2(7), and to a ffer zone extending twenty-five (25) feet landward from the edge of e ACEC. For those lots or land parcels totally encompassed by the EC, this Article's applicability will be limited to one hundred (100) et landward of the edge of wetlands as defined by MGL C. 131, Section 40. case of any dispute regarding the boundary of the areas defined der this Article. the Conservation Commission will be consulted, king the final determination based on the best available data.

ction 174-86. Regulation of construction and land alteration.

A. Within the above-described area, no construction of dwellings or any other primary or accessory buildings or structures, except those permitted under Section 174-25I(9) or Subsection D, is permitted.

B. Within the above described area, no clear cutting of vegetation or wildlife habitat, except for a path no more than twenty (20) feet wide to provide access to structures allowed under Section 174-25I(9) or for trail or other passive recreational uses operated by the town, state or other public agency, is permitted.

C. No dumping, fill, paving, removing of material or dredging may be done, except as permitted under the requirements MGL C. 131, Sections 40 and 40A, and any other applicable laws, bylaws and regulations.

D. Any structure which lies wholly or partly within the above described area and which was lawfully in existence or for which a building permit was legally granted prior to the publication date of the Town Meeting Warrant article adopting this Article, may be continued, repaired, maintained, improved or enlarged or replaced in case of its destruction, provided that no improvement, enlargement or other new construction may extend more than ten (10) feet closer to any open water, watercourse, marsh or other wetland as defined by MGL.C. 131, Section 40, (and in no case into such areas)

than its location prior to the above date.

E. Repair and maintenance of any road, bikeway or trail within the above described area is permitted. Construction of any new road, bikeway or other way requiring paving, fill or other significant construction is prohibited except for roads, bikeways or other ways constructed by the town, state or other public agencies or where the Board of Appeals has granted a variance from these requirements in order to allow access to areas not included in the above described area to which access would otherwise be impossible. Any construction, repair, maintenance, improvement or enlargement of such roads, bikeways or other ways shall be in conformance with the requirements of MGL C. 131, Sections 40 and 40A, and all other applicable laws, bylaws and regulations.

F. Any owner of a lot which is buildable at the time of the effective date of this Article, but which is made unbuildable due to its requirements, may apply to the Board of Appeals for a variance from the requirements of this Article. The Board of Appeals shall consult the Conservation Commission in making its decision, and in no case shall the grant of relief be more than the

minimum necessary to allow a reasonable use of the lot. The Board of Appeals, in considering applications hereunder, shall give primary importance to the

protection of the environment.

G. No provisions of this Article are intended to supersede or otherwise limit the authority of the Conservation Commission under MGL C. 131, Sections 40 and 40A, or the

APPENDIX C

Sample Conservation/Open Space Zoning Districts

1) Winchester, Massachusetts Zoning By-Law. Section 1, Establishment of Districts. Conservancy-Institutional District.

2) Stoneham, Massachusetts Zoning By-Law. Section 4.10, Use Regulations for Recreation/Open Space Districts.

Note: These exceprts from the Winchester and Stoneham zoning bylaws were downloaded from the MuniLaw database program in January, 1997. Any errors, of ommission, or otherwise, originate from the MuniLaw database.

NCHESTER ZONING BY-LAWS - SECTION 1 ESTABLISHMENT OF DISTRICTS
1.4 Special Districts

1.41 Conservancy-Institutional Districts (SCI-0.50) are
tended primarily as public use districts in which the
edominant purposes for the land are for conservational,
ucational, institutional and recreational uses. The districts
e also intended to preserve and increase the amenities of the
wn: to provide a specially suitable setting for public and
asi-public buildings and structures; to restrict residential
es of the land: to prohibit commercial (including commercial
creation), industrial, and other uses of the land which would
minish its value in providing the foregoing setting of said
ildings and in serving the conservational, educational and
creational needs of Winchester. In addition. the districts are
ecifically intended for the preservation and maintenance of the
ound water table for the protection of public health and
fety, persons and property against the hazards of flood water
undation: for the protection of the community against the costs
ich may be incurred when unsuitable development occurs in
amps, along water-courses, or in areas subject to floods: and
r the conservation of natural conditions, wild life, and open
aces for the, education, recreation and general welfare of the
blic.

ONEHAM ZONING BY-LAWS - SECTION 4.0 USE REGULATIONS
10 RECREATION/OPEN SPACE DISTRICTS:

10.1 Purpose:
The purpose of the Recreation/Open Space District is to provide areas of low intensity public and semipublic uses which serve to protect and preserve the water supply, ground water quality and natural features and/or features which serve a regional purpose.

10.2 Uses Permitted:

10.2. Conservation areas for water, water supply, plants, and wildlife, flood protection and necessary for achieving these purposes.

10.2.2 Agriculture, floriculture, horticulture, viticulture, forests, and tree farms, provided that any equipment necessary for these uses is normally stored in an enclosure, and is not visible from district or property boundaries.

10.2.3 Cemeteries.

10.2.4 Recreational, cultural, civic and not for profit expositions when the land/structures are owned by the Town of Stoneham (5/12/86).

10.3 Uses Permitted on a Special permit Granted by the Planning Board and the Board of Selectmen.

10.3.1 Recreational, cultural, civic and not for profit expositions when the land/structures are not owned by the Town of Stoneham (5/12/86)

10.3.2 Zoos, public gardens, day camps, picnic areas and nature study areas.

10.3.3 Accessory uses, including snack bars, pro shops and retail sales in connection with and incidental to a permitted use.

APPENDIX D

DEP Stormwater Management Policy and Standards

November 18, 1996

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ONE WINTER STREET, BOSTON MA 02108 (617) 292-5500

WILLIAM F. WELD
Governor

ARGEO PAUL CELLUCCI
Lt. Governor

TRUDY COXE
Secretary

DAVID B. STRUHS
Commissioner

STORMWATER MANAGEMENT POLICY

PURPOSE

The goal of the Stormwater Management Policy is to improve water quality and address water quantity problems by the implementation of performance standards for stormwater management. Urban runoff and discharges from stormwater outfalls are the single largest source responsible for water quality problems in the Commonwealth's rivers, lakes, ponds, and marine waters. The Stormwater Management Standards establish clear and consistent guidelines for stormwater management in Massachusetts. The Standards are designed for use under multiple statutory and regulatory authorities of the Department of Environmental Protection, including the Wetlands Protection Act, as amended by the Rivers Protection Act, and the Clean Waters Act.

Stormwater discharges occur as rainfall and snow melt carries pollutants to surface and groundwater. New and existing development increases impervious surfaces, which alters natural drainage features, increases peak discharge rates and volumes, and reduces recharge to maintain wetlands and baseflows in streams. Development also results in corresponding increases in the concentration and types of pollutant loadings, including nutrients, solids, metals, salt, pathogens, pesticides, and hydrocarbons. Best Management Practices (BMPs) reduce or prevent pollutants from reaching water bodies and control the quantity of runoff from a site. The Stormwater Management Standards address both water quality (pollutants) and water quantity (flood control) problems by establishing the level of required controls through the use of BMPs.

The Stormwater Management Standards are intended to be applied during routine project review by issuing authorities under the Wetlands Protection Act. Use of the standards should prevent or minimize adverse environmental impacts due to unmanaged stormwater while limiting undue costs and recognizing site constraints. Applicants should submit the one-page form developed by DEP which presents in a simple and concise format how the Stormwater Management Standards have been met. The form will allow commissions and the Department easy access to the stormwater management components of the project, and should simplify the review process for the applicant.

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REGULATORY AUTHORITY

The basic approach to implement the Stormwater Management Standards is to rely on review by conservation commissions or the Department under the Wetlands Protection Act for new development and on the Department's authority under the state Clean Waters Act for remediation of existing discharges. The Standards support existing legal authority, serving as the Department's interpretation of its existing regulations[1].

For new development and redevelopment, conservation commissions or the Department should regulate stormwater through an Order of Conditions whenever jurisdiction is established under the Wetlands Protection Act. Unmanaged and untreated stormwater will alter resource areas and require conditions to meet certain performance standards and to protect the interests of the Act. The Guidance for Implementation of the Rivers Protection Act requires projects to manage stormwater according to these Standards.[2]

The regulations contain explicit jurisdiction over point source discharges, including stormwater.[3] In the absence of an NPDES permit entitled to a presumption,[3] local conservation commissions or the Department should comply with 310 CMR 10.05(6) which instructs issuing authorities to impose conditions on the quality and quantity of discharges from either closed or open channel point sources to protect the interests of the Act provided the point source is within a resource area or the buffer zone. Even if the source of the stormwater discharge originates outside jurisdictional areas, issuing authorities should ensure that the Standards are met at the point of discharge, provided the discharge is within geographic jurisdiction.[4] In addition,

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[1] Applicable Regulations and Requirements

Administered by conservation commissions and the Department:
- 310 CMR 10.00 (Wetlands Protection Act)
- Rivers Protection Act Amendments to the Wetlands Protection Act

Administered by the Department of Environmental Protection:
- 314 CMR 9.00 (401 Water Quality Certification)
- 314 CMR 3.00 (Surface Water Discharge Permit Program)
- 314 CMR 4.00 (Surface Water Quality Standards)
- 314 CMR 5.00 (Groundwater Discharge Permit Program)
- 314 CMR 6.00 (Ground Water Quality Standards)
- 401 Certification Conditions of EPA General Permits

[2] The performance standards also apply under the set back and BMP requirements for stormwater management in DEP's 401 Water Quality Certification program (314 CMR 9.06) and the state certification requirements for EPA's General and Multi-Sector Permits for Stormwater Discharges.

[3] Under 310 CMR 10.03, the effluent limits of an NPDES permit are presumed to protect the interests of the Act; this refers to individual rather than general permits. EPA has issued very few individual NPDES permits for stormwater discharges.

[4] For example, a developer proposes an overflow pipe within the buffer zone from a detention basin that is outside the riverfront area. The issuing authority can insist that the standards are met at the overflow pipe but cannot prescribe the BMP, such as the detention basin, used to achieve the standards. In order to evaluate whether the standards can be met, the issuing authority may require information about structures and practices beyond the riverfront area provided it is directly related to the discharge.

by placing limitations on the quantity of the discharge from any point sources, commissions and the Department can ensure that the stormwater generated from future developments cannot simply be routed through existing drainage outfall pipes.

To address existing discharges, the Department will use watershed assessments and remedial action under its Clean Waters Act authority. Existing discharges include municipal storm sewer systems and drainage structures from developed areas with point sources to wetlands or water bodies. Massachusetts has regulations under the state Clean Waters Act specifying when a state surface water discharge permit for stormwater is required. Discharges that meet the Stormwater Management Standards do not need permits. Discharges that do not meet the Standards may be identified during water quality sampling conducted in each basin as part of the watershed assessment and planning process. The Department will promote voluntary compliance wherever possible. In some cases, DEP may designate a discharge as a significant contributor of pollutants which requires a permit or use enforcement mechanisms to achieve remediation of stormwater-impaired waterways.

APPLICABILITY

The Stormwater Management Standards apply to industrial, commercial, institutional, residential subdivision, and roadway projects, including site preparation, construction, redevelopment, and on-going operation.

The Stormwater Management Standards do not apply to:[5]

(1) Single-family house projects;
(2) Residential subdivisions with four or fewer lots, provided any discharge will not affect a critical area; or
(3) Emergency repairs to roads or their drainage systems.

The Stormwater Management Standards apply to the extent practicable to:

(1) Residential subdivisions with four or fewer lots with a discharge potentially affecting a critical area; and
(2) Five to nine residential lots, provided any discharge will not affect a critical area.

BMPs for compliance "to the extent practicable" must, at a minimum, include: extended detention pond, water quality swale, dry well (rooftop runoff only), sand and organic

[5] For projects of any size, direct discharges of untreated stormwater from pipes to wetlands or waters are not allowed. Erosion and sedimentation control during construction must be provided.

filter, and pretreatment devices. Project proponents must demonstrate that they are implementing the highest practicable level of stormwater treatment. Critical areas are Outstanding Resource Waters (ORWs), shellfish beds, swimming beaches, cold water fisheries and recharge areas for public water supplies.

The Stormwater Management Standards apply to five to nine lot residential subdivisions with discharges potentially affecting critical areas and any subdivision of 10 or more lots, as well as other activities. Residential development that is part of a phased development project does not qualify for the exemption. These thresholds do not preclude these activities from meeting applicable state regulatory requirements not directly related to the stormwater discharge.

STORMWATER MANAGEMENT STANDARDS

The Department will presume that projects meeting the Stormwater Management Standards satisfy regulatory requirements. When one or more of the Standards cannot be met, an applicant may demonstrate that an equivalent level of environmental protection will be provided.

1. No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

2. Stormwater management systems must be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.

3. Loss of annual recharge to groundwater should be minimized through the use of infiltration measures to the maximum extent practicable. The annual recharge from the post-development site should approximate the annual recharge from the pre-development or existing site conditions, based on soil types.[6]

4. For new development, stormwater management systems must be designed to remove 80% of the average annual load (post-development conditions) of Total Suspended Solids (TSS). It is presumed that this standard is met when:
   (a) Suitable nonstructural practices for source control and pollution prevention are implemented;
   (b) Stormwater management best management practices (BMPs) are sized to capture the prescribed runoff volume; and
   (c) Stormwater management BMPs are maintained as designed.

[6] "To the extent practicable" means the applicant has made all reasonable efforts to meet the standards, including evaluation of alternative BMP designs and their locations.

5. Stormwater discharges from areas with higher potential pollutant loads require the use of specific stormwater management BMPs (see chart on page 7). The use of infiltration practices without pretreatment is prohibited.

6. Stormwater discharges to critical areas must utilize certain stormwater management BMPs approved for critical areas (see list on page 9). Critical areas are Outstanding Resource Waters (ORWs), shellfish beds, swimming beaches, cold water fisheries and recharge areas for public water supplies.

7. Redevelopment of previously developed sites must meet the Stormwater Management Standards to the maximum extent practicable. However, if it is not practicable to meet all the Standards, new (retrofitted or expanded) stormwater management systems must be designed to improve existing conditions.

8. Erosion and sediment controls must be implemented to prevent impacts during construction or land disturbance activities.

9. All stormwater management systems must have an operation and maintenance plan to ensure that systems function as designed.

EXPLANATION OF STANDARDS

Untreated Stormwater (Standard 1)

Treated stormwater is defined to be stormwater that meets the requirements in Standards 2 through 9. Rooftop runoff, except from metal roofs (which have higher potential pollutant loads), generally should be considered uncontaminated for the purposes of these Standards and therefore can be infiltrated directly without treatment.

Post-Development Peak Discharge Rates (Standard 2)

To meet Standard 2, controls must be developed for the 2-year and the 10-year 24-hour storm events. The 100-year 24-hour storm event must be evaluated to demonstrate that there will not be increased flooding impacts offsite.

Measurement of peak discharge rates must be calculated using the point of discharge or the downgradient property boundary. The topography of the site may require evaluation at more than one location if flow leaves the property in more than one direction. An applicant may demonstrate that a feature beyond the property boundary (e.g. culvert) is more appropriate as a design point.

Discharges to waters subject to tidal action do not need to maintain predevelopment peak discharge rates. All other Standards must be met.

Recharge to Groundwater (Standard 3)

The prescribed stormwater runoff volume to be recharged to groundwater should be determined using the existing site (pre-development) soil conditions (from a U.S. Natural Resources Conservation Service (NRCS, formerly SCS)) County Soils Survey, onsite soil evaluation, or other geologic information) and these rates:

Hydrologic Group	Volume to Recharge (x Total Impervious Area)
A	0.40 inches of runoff
B	0.25 inches of runoff
C	0.10 inches of runoff
D	waived

Water Quality (Standards 4-6)

The runoff volume to be treated for water quality is based on the following:

(1) For discharges to critical areas, the volume to be treated is calculated as 1.0 inch of runoff times the total impervious area of the post-development project site.
(2) For all other discharges, volume to be treated is calculated as 0.5 inches of runoff times the total impervious area of the post-development project site.

Using the impervious area as the basis for calculating stormwater runoff promotes the use of straight-forward volume calculations. The total impervious area of a site is determined based on final project site plans, not on pre-existing site conditions. Roof runoff (except from metal roofs) may be infiltrated, and any infiltrated volume may be subtracted from the total runoff volume.

Removal of 80% TSS (Standard 4)

BMPS must be selected so that a total of 80% TSS removal is provided by one or more BMPs as shown on the following chart. Use the column showing design rates for the projected removal rate, unless there is a demonstration that a higher or lower figure within the column showing the range of average TSS should be used. BMPs not listed below should be evaluated based on data on removal efficiencies provided by the applicant. The 80% TSS

removal requirement[7] applies to post-development conditions after the site is stabilized. Monitoring should not be required.[8]

TSS Removal Rates (adapted from Schueler, 1996 & EPA, 1993)

BMP List	Design rate	Range of Average TSS Removal Rates	Brief Design Requirements
[Extended] Detention Pond	70%	60-80%	Sediment forebay.
Wet Pond (a)	70%	60-80%	Sediment forebay.
Constructed Wetland (b)	80%	65-80%	Designed to infiltrate or retain.
Water Quality Swale	70%	60-80%	Designed to infiltrate or retain.
Infiltration Trench	80%	75-80%	Pretreatment critical.
Infiltration Basin	80%	75-80% (predicted)	Pretreatment critical.
Dry Well	80%	80% (predicted)	Rooftop runoff (uncontaminated only.
Sand Filter (c)	80%	80%	Pretreatment.
Organic Filter (d)	80%	80%+	Pretreatment.
Water Quality Inlet	25%	15-35% w/cleanout	Off-line only; 0.1" minimum Water Quality Volume (WQV) storage.
Sediment Trap [Forebay]	25%	25% w/cleanout	Storm flows for 2 year event must not cause erosion; 0.1" minimum WQV storage.
Drainage Channel	25%	25%	Check dams; non-erosive for 2yr.
Deep Sump and Hooded Catch Basin	15%	15% w/cleanout	Deep sump general rule=4 x pipe diameter or 4.0' for pipes 18" or less.
Street Sweeping	10%	10%	Discretionary non-structural credit, must be part of approved plan.

[7] Total suspended solids was selected as the target pollutant constituent for a removal standard because of its widespread contribution to water quality and aquatic habitat degradation, because many other pollutant constituents including heavy metals, bacteria, and organic chemicals sorb to sediment particles, and because the available data sets for BMP removal efficiency reveal that TSS has been the most frequently and consistently sampled constituent.

[8] Issuing authorities may impose sampling or monitoring requirements when developers propose alternative stormwater management techniques or in unusual circumstances where deemed necessary to protect sensitive ecological receptors or public health.

NOTES:
(a) Includes wet extended detention ponds, wet ponds, multiple pond designs.
(b) Includes shallow marsh, extended detention wetlands, pocket wetland, and pond/wetland designs.
(c) Includes surface, underground, pocket and perimeter designs.
(d) Includes compost, peat/sand, and Storm Treat designs.

Land Uses with Higher Potential Pollutant Loads (Standard 5)

Residential, office, and institutional development and roads normally will not yield high potential pollutant loads. However, certain land uses generate higher concentrations of pollutants than found in typical runoff, based on existing data. Source reduction is recommended. These areas are subject to the requirement of Standard 5:

(1) Stormwater discharges associated with Standard Industrial Classifications [NPDES stormwater permit program requirements apply]
(2) Auto salvage yards (auto recycler facilities)
(3) Auto fueling facilities (gas stations)
(4) Fleet storage areas (cars, buses, trucks, public works)
(5) Vehicle service, maintenance and equipment cleaning areas
(6) Commercial parking lots with high intensity use. Such areas typically include fast-food restaurants, convenience stores, high-turnover [chain] restaurants, shopping centers and supermarkets.
(7) Road salt storage and loading areas (if exposed to rainfall)
(8) Commercial nurseries
(9) Metal rooftops, including roofs made from aluminum, tin, galvanized steel, copper, or rooftops which have been documented to contribute significant pollutant loads
(10) Outdoor storage and loading/unloading areas of hazardous substances
(11) SARA 312 generators (if materials or containers are exposed to rainfall)
(12) Marinas (service, repainting, and hull maintenance areas)

Required within areas with higher potential pollutant loads:
(1) Source reduction (pollution prevention, snow management); and
(2) Pretreatment (water quality inlets, sediment traps, drainage channels, water quality swales, and/or deep sump catch basins).

Prohibited within areas of higher potential pollutant loads if also a critical area:
(1) Infiltration trenches;
(2) Infiltration basins; or
(3) Dry wells.

Restrictions apply to certain BMPs:
Sand or organic filters, detention basins, wet ponds, or constructed wetlands may be used only if sealed or lined.

Critical Areas (Standard 6)

BMPs approved for use near critical areas, designed to treat 1.0 inch of runoff times the total impervious surface of the post-development project site, are generally limited to:

- Extended detention basins
- Wet ponds
- Constructed wetlands
- Water quality swales
- Sand filters
- Organic filters
- Infiltration basins
- Infiltration trenches
- Deep sump and hooded catch basins (used with other BMPs)

Stormwater management systems near public water supplies and other critical resources should incorporate designs which allow for shut-down and containment in the event of an emergency spill or other unexpected contamination event.

Redevelopment (Standard 7)

"Redevelopment" projects are defined as follows:

(1) Maintenance and improvement of existing roadways, including widening less than a single lane, adding shoulders, and correcting substandard intersections and drainage, and repaving; and
(2) Development, rehabilitation, expansion, and phased projects on previously developed sites, provided the redevelopment results in no net increase in impervious area.

Components of redevelopment projects which include development of previously undeveloped sites do not fall under Standard 7.

Erosion and Sedimentation Controls (Standard 8)

Examples of BMPs for erosion and sedimentation control are staked hay bales, filter fences, hydroseeding, and phased development. Many stormwater BMP technologies (e.g infiltration technologies) are not designed to handle the high concentrations of sediments typically found in construction runoff and must be protected from construction-related sediment loadings. Construction BMPs must be maintained.

Operation and Maintenance Plans (Standard 9)

An operation and maintenance plan (O&M Plan) should, at a minimum, identify:

(1) stormwater management system(s) owner(s);
(2) the party or parties responsible for operation and maintenance;
(3) a schedule for inspection and maintenance; and
(4) the routine and non-routine maintenance tasks to be undertaken.

The owner of the BMP is generally considered to be the landowner of the property on which the BMP is located, unless other legally binding agreements are established with another entity. The Order of Conditions and Certificate of Compliance should be written to allow for routine maintenance during construction and post-development phases of the project as defined in the O&M Plan. A continuing condition in the Certificate of Compliance will ensure that maintenance can be performed without triggering further filings under the Wetlands Protection Act.

Wetlands Protection Program Policy
Issued November 18, 1996

Stormwater Management Form

This form is intended to ensure that proposed stormwater control designs meet the stormwater management standards described in the Department of Environmental Protection's Stormwater Management Policy (November 1996). The Department of Environmental Protection (DEP) recommends that applicants submit this form with the Notice of Intent, as well as supporting documentation and plans, to provide stormwater information for conservation commission review. If a particular stormwater management standard cannot be met, information should be provided to demonstrate how adequate water quality and water quantity protection will be provided by the project. DEP encourages engineers to use this form to certify that the project meets the stormwater management standards as well as acceptable engineering standards. This form should be completed by checking the appropriate boxes for each standard and by signing and stamping the back of this form.

Project Location:_____

☐ The proposed project is / is not (circle one) exempt from one or more of the stormwater management standards.
If project is exempt, explain why:_____

Stormwater runoff volumes to be treated for water quality are based on the following calculations:
(check one that applies)

- ☐ 1 inch of runoff x total impervious area of post-development site for critical areas (e.g. Outstanding Resource Waters and shellfish growing areas)
- ☐ 0.5 inches of runoff x total impervious area of post-development site for other resource areas

Standard #1: Untreated stormwater (See plan _____)

☐ The project is designed so that new stormwater conveyances (outfalls/discharges) do not discharge untreated stormwater into, or cause erosion to, wetlands or waters.

Standard #2: Post-development peak discharge rates (See plan _____)

☐ Post-development peak discharge rates do not exceed pre-development rates on the site either at the point of discharge or downgradient property boundary.
- ☐ N/A - project site contains waters subject to tidal action, so standard is not applicable.

☐ Stormwater controls have been designed for the 2-year and 10-year, 24-hour storms.

☐ The project's stormwater design will not increase flooding impacts offsite from the 100-year, 24-hour storm.

Standard #3: Recharge to groundwater (See plan _____)

☐ The annual groundwater recharge for the post-development site approximates annual recharge from existing site conditions.

☐ Soil types have been identified according to either the U.S. Natural Resources Conservation Service (NRCS) County Soils Survey or onsite soil evaluation. Calculations on stormwater flow are based on a soil hydrologic group of _____, and total impervious area of _____(square feet).

☐ Soil types at each planned point of stormwater runoff infiltration include:

☐ Infiltration Best Management Practices (BMPs) used for this project include:

Standard #4: 80% TSS removal (See plan _____)

☐ The proposed stormwater management systems will remove 80% of the post-development site's average annual load of Total Suspended Solids (TSS).

☐ The BMPs selected for this project include (list BMPs with TSS removal rates):

Standard #5: Higher potential pollutant loads (See plan _____)

☐ The project site does / does not (circle one) contain Land Uses with Higher Potential Pollutant Loads.
If site contains such land uses, describe: _____

☐ If applicable, BMPs selected for controlling stormwater in these areas are designed to prevent infiltration of untreated stormwater and include:

Standard #6: Protection of critical areas (See plan _____)

☐ The project site does / does not (circle one) contain critical areas with sensitive resources.
If site contains critical areas, describe: _____

☐ If applicable, BMPs selected for stormwater discharges in these areas include:

Standard #7: Redevelopment projects (See plan _____)

☐ The proposed activity is / is not (circle one) a redevelopment project.
Note: Components of redevelopment projects which plan to develop previously undeveloped sites do not fall under the scope of Standard 7.

☐ If the project is a redevelopment project, the following stormwater management standards have been met:

☐ The standards which have not been met include:

☐ The proposed project will reduce the annual pollutant load on the site with new or expanded stormwater controls

Standard #8: Erosion/sediment control (See plan _____)

☐ Erosion and sediment controls are incorporated into the project design to prevent erosion, control sediment movement, and stabilize exposed soils.

Standard #9: Operation/maintenance plan (See plan _____)

☐ An operation and maintenance plan for both construction and post-development stormwater controls has been developed. *The plan includes BMP owner(s); parties responsible for operation and maintenance; schedule for inspection and maintenance; routine and non-routine maintenance tasks; and provision for appropriate access and maintenance easements surrounding control(s) and extending to public right-of-way.*

I attest under the penalties of perjury that I have personally examined and am familiar with the information contained in this submittal, including any and all documents, accompanying this certification statement; and that I am fully authorized to make this attestation on behalf of the project applicant.

_____

Print Name Date

(Stamp/Signature)

APPENDIX E

Local Practices

1) Schedules for Street Sweeping and Catch Basin Cleaning

2) Road Salting Practices

3) Household Hazardous Waste and Waste Oil Collection Programs

APPENDIX E

Local Practices

E-1) Schedules for Street Sweeping and Catch Basin Cleaning

E-2) Road Salting Practices

E-3) Household Hazardous Waste and Waste Oil Collection Programs

Apppendix E-1

Schedules for Street Sweeping and Catch Basin Cleaning in the Fowl Meadow/Ponkapoag Bog ACEC

Town or Agency	Street Sweeping Practices	Catch Basin Cleaning/Design
Mass Highway Department (Routes 128, 1, 1a, I-95, 138, Blue Hill Drive)	Sweep highways twice per year, in spring and in fall before the first snowfall.	All basins cleaned once per year. No oil/gas traps.
Metropolitan District Commission (MDC) (Neponset Valley, Truman & Blue Hills Pkwys, Green St.)	All roads swept in spring to clean winter debris. Otherwise, roads swept on as-needed basis. Truman Highway and Neponset Valley Parkway swept approximately twice monthly.	Basins cleaned according to need, ranging from less than annually to more than twice per year. No oil/gas traps.
Canton	Attempt to sweep all roads once/year. Many roads done twice/year, town center done once/week.	Attempt to clean each basin once per year, but budget does not always allow. Problem areas prioritized. Older basins do not have oil/gas traps; new basins do.
Dedham	All streets done once/year. Main roads done once/month and downtown once/week.	All basins cleaned once per year. Treatment (e.g., oil/gas traps) required in wetland areas for new projects.
Milton	Major roads done at least once/year in spring. Concentrate on major roads (side streets not sanded). Spend approximately $10 - $15k/year on street sweeping.	Spend approximately $23 - $24k per year on drainage maintenance, mostly for catch basin cleaning. Try to keep one DPW person full-time on catch basin cleaning during good weather months.
Norwood	Every street done approximately 3 times/year. Center of town done weekly. Start sweeping in March and continue program until first freeze.	5600 catch basins in town. Basins at bottoms of hills prioritized & cleaned 3 to 5 times/year. Others cleaned as needed. Basins color coded to show when cleaned. Some basins in subdivisions maintained privately
Sharon	All roads done once/year.	All basins cleaned approximately once every two years.
Westwood	All roads done each spring, and all roads done at least twice/year. Main roads done every month; town center every week.	All basins cleaned once/year in the fall. Most basins do not have oil/gas traps. University Ave. reconstruction to include oil separators.

APPENDIX E-2

Road Salting Practices in the Fowl Meadow/Ponkapoag Bog ACEC

Town or Agency	Description of Practice
Mass. Highway Department (Routes 128, 1, 1a, I-95, 138, Blue Hill Drive)	Straight salt used (no sand) at rate of 240 lbs. per lane mile per application. MHD operates a salt storage shed within the ACEC, at the end of the I-95 stub in Canton.
Metropolitan District Commission (Neponset Valley, Truman and Blue Hills Pkwys, Green St.)	Depending on conditions use straight salt, 1:1 mix of sand/salt, or straight sand. Material applied depends on time of day, day of week, current and predicted weather conditions, volume of traffic on roadway, incline and curves.
Canton	No salt used near wellheads. In other areas typically use 3:1 sand/salt mix.
Dedham	Use 3:1 sand:salt application on main arteries. Residential areas plowed only, except for hills. In ACEC, Sprague St. and hills on Greenlodge St. would be salted; no salt on other roads between ACEC and the river.
Milton	Use 6:1 to 8:1 sand:salt application on main roads, on average. Side streets plowed only except for hills and/or icy conditions.
Norwood	Typically use 4:1 sand:salt mix except for major roadways (Neponset St., University Ave., town center) which receive straight salt.
Sharon	Typically use 5:1 sand:salt mix and calcium chloride.
Westwood	Sand:salt ratio depends on storm. Usually use 3:1, sometimes 5:1.

Appendix E-3

Household Hazardous Waste and Waste Oil Collection Programs in the Fowl Meadow/Ponkapoag Bog ACEC

Town	Household Hazardous Waste Programs	Waste Oil Collection Programs
Canton	Annual HHW collection day.	No separate program
Dedham	Annual HHW collection day.	No separate program.
Milton	Try to do one HHW collection day every other year. Have an automotive recycling day (waste oil, automotive batteries, tires) twice a year.	Twice per year (see HHW entry).
Norwood	Annual HHW collection day in the spring. Automotive recycling day twice per year (tires, batteries, waste oil, antifreeze, propane tanks).	Drop-off at DPW yard, daily during work hours.
Sharon	Annual HHW collection day.	No separate program.
Westwood	Annual HHW collection day.	1st and 3rd Saturdays of the month; drop-off at recycling area.

Legend: HHW = household hazardous waste